

**BRUNSWICK SCHOOL DEPARTMENT  
REVENUE AND EXPENSE REPORT FOR JANUARY 2015**

School Year 2014-2015

Revenues		Annual Budget	Revenues through 1/31/2015	Remaining Bal.	% Collected
Unapprop. Fund Bal.		3,337,000.00	3,337,000.00	0.00	100.00%
State Subsidy		9,946,831.00	5,101,346.11	4,845,484.89	51.29%
Federal Subsidy		0.00	13,758.19	-13,758.19	0.00%
Local Share		22,188,756.00	22,188,756.00	0.00	100.00%
Tuition		137,000.00	99,389.27	37,610.73	72.55%
Misc.		118,000.00	31,289.17	86,710.83	26.52%
Other		36,000.00	36,000.00	0.00	100.00%
<b>Total Revenue</b>		<b>35,763,587.00</b>	<b>30,807,538.74</b>	<b>4,956,048.26</b>	<b>86.14%</b>
Expenses By Warrant Number		Adjusted Budget	Expended Through 1/31/2015	Remaining Bal.	% Expended
1	Regular Instruction	15,438,450.62	6,482,907.17	8,955,543.45	41.99%
2	Spec. Ed. Instruction	5,024,342.65	2,184,544.05	2,839,798.60	43.48%
3	CTE	777,397.66	453,481.98	323,915.68	58.33%
4	Other Instruction	667,046.00	336,923.25	330,122.75	50.51%
5	Student & Staff Support	3,422,777.27	1,783,723.54	1,639,053.73	52.11%
6	System Administration	827,674.39	467,230.60	360,443.79	56.45%
7	School Administration	1,463,003.00	796,743.19	666,259.81	54.46%
8	Transportation	1,878,023.26	998,964.10	879,059.16	53.19%
9	Operation & Maintenance	4,301,719.30	2,123,995.70	2,177,723.60	49.38%
10	Debt Service	1,822,001.85	1,822,001.85	0.00	100.00%
11	All Other	36,000.00	36,000.00	0.00	100.00%
12	Adult Education	105,151.00	105,151.00	0.00	100.00%
<b>Total Budget</b>		<b>35,763,587.00</b>	<b>17,591,666.43</b>	<b>18,171,920.57</b>	<b>49.19%</b>

# **Brunswick High School**

## **Statement of Beliefs And Supporting Values**

1. We believe that engaging students in a culture of achievement represents the most reliable pathway to post-graduate success for our students; therefore, we value:
  - Recognizing the diversity of ability amongst our students and the creation of multiple pathways to success.
  - Creating an atmosphere of high expectations for our students and concrete recognition when they exceed these expectations.
  - Building systems that allow students to create short and long-term goals and that measure a student's progress towards these goals.
  
2. We believe that academic excellence is the primary, foundational mission of Brunswick High School. The artistic, extra-curricular, co-curricular and social opportunities that exist at Brunswick High School are there to support this core academic mission; therefore, we value:
  - A core academic program that is challenging, rigorous and which emphasizes both breadth of understanding as well as depth of content.
  - Class sizes that are appropriate to this mission.
  - Providing opportunities for students to be engaged in learning activities outside the classroom.
  - Encouraging students to engage in a process of continuous improvement.
  
3. We believe that our school, town, state, national and international communities cannot flourish without citizens of strong character; therefore, we value:
  - A school culture that emphasizes honesty, integrity and compassion and holds students accountable for their ethical behavior as well as their academic performance.

- An academic environment that makes students aware of the global context in which they make their decisions.
- A professional environment in which all staff members understand their importance as ethical role models for all the students at Brunswick High School.

4. We believe that Brunswick High School as an institution and students as individuals benefit from significant partnerships with the community; therefore, we value:

- Fostering good relationships with the citizens and institutions that constitute the Brunswick community.
- Programs that offer students opportunities for off-campus learning experiences that enhance their academic studies at Brunswick High School.
- Partnerships with institutions who offer students the opportunity to realize the applicability and purpose of their studies at Brunswick High School.

5. We believe that a professional, collegial atmosphere is essential to our success as educators and is an essential element of the core academic mission of Brunswick High School; therefore, we value:

- A manageable academic workload that accommodates collegiality among faculty members.
- Clear and effective leadership from the administration.
- An administration that supports the professional growth of faculty members both as individuals and as members of a department.
- An atmosphere in which all staff members respect each other's efforts in our common mission of educating all of our students.
- Professional time set aside for collaboration as members of a department and for collaboration between departments.

# **Brunswick High School**

## **21st Century School-Wide Learning Expectations**

### **Academic Expectations**

1. Students will be able to communicate effectively by writing, reading and speaking at, or above, grade level, across the curriculum.
2. Students will be able to effectively engage and demonstrate critical thinking skills and problem-solving abilities.
3. Students will be able to approach academic challenges with creativity and innovation.
4. Students will be able to demonstrate a mastery of content as specified by the curriculum of Brunswick High School and the requirements of the Common Core.
5. Students will work with academic integrity.
6. Students will engage in an informed and ethical use of technology.

### **Social Expectations**

1. Students will demonstrate an ability to work collaboratively, as well as independently.
2. Students will consistently be respectful of themselves, of others and of the school.
3. Students will be encouraged to participate in extra-curricular activities as they strive to become well-rounded and purposeful individuals.

### **Civic Expectations**

1. Students will engage in community service activities as defined by the graduation requirements of Brunswick High School.

# Summary of Strengths and Needs

## Strengths

- Brunswick High School's faculty and administration unanimously support the school's "Statement of Beliefs and Learning Expectations" and "21<sup>st</sup> Century Learning Expectations". The faculty and administration are enthusiastic about the continuing process to incorporate these into our curriculum and school culture.
- Brunswick High School's curriculum strongly supports the development of higher-order thinking skills amongst its students. There is emphasis on problem-solving and critical thinking and this is supported by a number of cross-disciplinary programs as well as options for extending learning off-campus.
- The parents, students and teachers all agree that instruction at BHS is provided by a teaching staff that are knowledgeable in their content areas, that instruction focuses on the development of higher-order thinking skills and is influenced by feedback from parents and students. The teachers at BHS are self-directed, life-long learners and attempt to imbue their students with this same initiative.
- Teachers at BHS use a wide-range of formative and summative assessments to assess student achievement and they are supported by a professional staff that collects, disaggregates and analyzes a wide range and wide variety of data to identify and address inequities in student achievement.
- The culture at Brunswick High School supports and facilitates both staff and student engagement during the school day and through a variety of co-curricular activities. The entire faculty is actively engaged in promoting student success on many levels and the students are proud of their school and work hard to improve their educational and personal experiences at BHS.
- Both students and faculty at Brunswick High School are extremely fortunate to work in an environment that offers a host of resources that enhance learning opportunities including integrated use of technology throughout the building, a well-funded library and media center, alternative educational opportunities and a strong counseling program.

- Brunswick High School is extremely fortunate to have strong community and parental support for its educational missions. Through its strong community service and service learning programs BHS has developed excellent relationships with a number of local businesses and organizations as well as local community colleges and universities.

### Needs

- The faculty needs to complete and approve school-wide analytic rubrics and then develop a plan for their implementation. As part of this process the school must become more proficient in using research and multiple data sources to develop rubrics and implement their use throughout the school.
- Develop a formal process to ensure continued emphasis – across all disciplines – on inquiry and problem-solving, higher order thinking, cross-disciplinary learning and authentic learning opportunities both in and out of school. This process should involve redefining the purpose and function of faculty and department meetings in order to increase formal meeting time for curriculum collaboration and development.
- The faculty at Brunswick High School need professional development time to collaborate with colleagues, examine student assessments and improve instructional practices. This professional development time must not diminish current preparatory time and should be linked to formal support and funding for on-going, content-specific, professional development.
- The faculty need to incorporate specific 21<sup>st</sup> Century Learning Expectations that will be assessed with units of study, communicate these expectations to the students and employ a formal process, based on school-wide rubrics, to assess whole school and individual student progress in reaching these goals.
- Establish a formal protocol so that faculty are engaged and invested in student success, ensuring that every student has an “adult in the school, in addition to the school counselor, who knows the student well and assists the student in achieving the school’s 21<sup>st</sup> Century Learning Expectations.
- Develop a plan to better integrate technology into the classroom including deployment of faster and more reliable computers, better communication to parents about resources that are available and more professional development time for teachers to work with media specialists to further integrate 21<sup>st</sup> century information skills into the curriculum.

- Establishment of a diverse parent group, representative of our student body, that meets on a regular basis, which will help support school initiatives as well as facilitating communication and cooperation between the high school and the community.
- The construction of a second access road that would facilitate the evacuation of the high school in case of emergency.

# Two-Year and Five-Year Targeted Plans

## Two-Year Targeted Plan:

- Development of school-wide rubrics that support the achievement of the school's 21<sup>st</sup> Century Learning Objectives.
- Development and deployment of power standards in each academic discipline.
- Investigate and develop additional learning opportunities, outside the traditional classroom, that would allow students to meet proficiency standards.
- Allocate more dedicated professional time to review, develop and implement curriculum.
- Survey teachers and parents to find more effective methods of communication and interaction.
- Create a program that is driven by the Core Values of BHS that meets the identified needs of students so that "every student has an adult in the building who will assist them in achieving the 21<sup>st</sup> Century Learning Objectives.
- Set aside more professional development time to continue to improve teaching and learning.
- Increase collaboration with classroom teachers and media/computer specialists in order to further integrate 21<sup>st</sup> century information skills as well as technology into the curriculum.
- The development of common assessments, based on content areas, that align with the school's power standards and are aligned with 21<sup>st</sup> century learning expectations.

## Five-Year Targeted Plan:

- Evaluate the use of the school-wide rubrics using multiple data sources and revise them as necessary.
- All student grade reporting to be completed using proficiency-based benchmarks based on power standards.
- Full implementation of proficiency based curriculum with a formal structure of ongoing review and modification.
- Develop a formal mechanism – or mechanisms – that allow for greater parental feedback, involvement and dialog with instructors.
- Conduct a full evaluation of any programs designed to provide "an adult in the building" for all BHS students.
- Construction of a second access road that would allow for evacuation in case of an emergency





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## OUR VIEW

# Public education must lead anti-poverty fight

With over half of all students from low-income families, an effective, equitable system is key.

**I**n the fight against poverty, public schools are the first line of defense. Teachers, counselors and administrators are in the best position to notice when a student is not getting enough food, doesn't have the proper clothing or is otherwise experiencing something at home that makes learning difficult, and it is those adults who are in the best position to see that student gets the help he needs so that school is not such a struggle.

It is an expensive and demanding responsibility for schools, one that goes far beyond the basics of education. But it is important, as for the first time in at least 50 years, more than half of the students in U.S. public schools come from low-income families.

That means that every decision related to education, from funding to curricula to support services, must be made with poverty and near-poverty as a consideration. Failure to do so — that is, failure to create an educational system that provides as much opportunity for those at the bottom of the income scale as those at the top — will only widen inequality and stunt economic growth while making a mockery of the promise of upward mobility.

### LOW-INCOME MAJORITY

The challenge is only becoming more immediate. A report by the Southern Education Foundation found that, as of 2013, 51 percent of students in pre-kindergarten through 12th grade were eligible for free and reduced-price lunch, up from 38 percent in 2000 and 32 percent in 1989. In Maine, around 43 percent of students receive free or reduced-price meals, up from around 30 percent in 2000.

There are a number of reasons for the increase — a rise in single-parent households and immigration, increased enrollment at private schools by those with means and stagnant wages amid rising costs — but the latest recession is not one of them.

Instead, this is a long-term trend that has survived booms and busts, starting first in the South then spreading to the West and beyond, so that now public schools in four-fifths of the states, including Maine, have very high pro-

portions of students from low-income families.

### FALLING BEHIND

Those students, more often than not, enter school behind academically and struggle to catch up. They have more unaddressed physical and mental health problems than their peers, as well as behavioral issues, all of which call for extra attention.

They also don't have the same access as others their age to enriching out-of-school activities, such as those involving art, music and sports. They don't get tutoring, or get to go on family trips.

With every year, they fall further behind. Low-income students have higher rates of absenteeism. They score lower on standardized tests. They are more likely to drop out, and less likely to attend college.

Now, with more than half of public school students facing those obstacles, we run the risk of cutting our economy off at the knees. Left unchecked, too many Americans will become adults without the skills or knowledge to compete in the global workforce.

### RENEWED COMMITMENT

The solution is a commitment to public education and all it has to accomplish.

That means not only valuing and rewarding the best educators, but also funding the pre-K and literacy programs that help low-income students get a fair start to school, as well as the preparatory and counseling initiatives that help them apply for and go to college.

That also means supporting the school-based social service programs that feed, clothe and counsel low-income students, and keep them engaged and learning after school and during the summer break.

It's not easy, and it is certainly not cheap. But it is necessary. Failing to provide an equal public education to low-income students is unfair when they make up a third of all students. When they make up more than half of all students, it's a potential disaster.

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ The three steps in creating a 2D parametric sketch are: sketching a rough 2D outline of a part, applying geometric constraints, and then adding parametric dimensions.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a constraint?</li> <li>▪ What is a parametric dimension?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Change the part and sketch Applications Options to meet your needs.</li> <li>▪ Use construction geometry to help constrain a sketch.</li> <li>▪ Change a dimension's value in a sketch.</li> <li>▪ Insert AutoCAD .dwg data into a part's sketch.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Constraints</li> <li>○ Planes</li> <li>○ Origin 3D indicator</li> <li>○ Polar coordinates</li> <li>○ Cartesian coordinates</li> <li>○ Fully constrained sketch</li> <li>○ Over constrained sketch</li> <li>○ Driven dimension</li> <li>○ Degrees of freedom</li> <li>○ Coincident</li> <li>○ Collinear</li> <li>○ Concentric</li> <li>○ Parallel</li> <li>○ Perpendicular</li> <li>○ Tangent</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Sketch an outline of a part.</li> <li>▪ Create geometric constraints to a sketch to control design intent.</li> <li>▪ Dimension a sketch.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>

**Basic 3D  
Modeling**

**Brunswick School Department  
Grade 10-12  
Unit 1 - Sketching, Constraining & Dimensioning**

**Draft 2/2/15**

<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Inventor 2015 Essentials Plus</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7">https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7</a></li><li>○ <a href="https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7">https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7</a></li></ul></li></ul>

Brunswick School Department  
Grade 10-12  
Unit 2 - Creating and Editing Sketched Features

Draft 2/2/15

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ After creating, constraining, and dimensioning a sketch, the next step in creating a model is to turn the sketch into a 3D feature.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a base feature?</li> <li>▪ What are the three operations types used to create sketched features?</li> <li>▪ How do you extrude a part?</li> <li>▪ How do you revolve a part?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Extrude a sketch into a part.</li> <li>▪ Revolve a sketch into a part.</li> <li>▪ Edit features of a part</li> <li>▪ Edit the sketch of a feature.</li> <li>▪ Project edges of a part.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Consumed sketch</li> <li>○ Unconsumed sketch</li> <li>○ Browser</li> <li>○ Extrude</li> <li>○ Linear diameter dimensions</li> <li>○ Primitive shapes/features</li> <li>○ Secondary 2D sketched features</li> <li>○ Join</li> <li>○ Cut</li> <li>○ Intersect</li> <li>○ Slice graphics</li> <li>○ Sketch features</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Describe what a feature is used for in the modeling process.</li> <li>▪ Use direct manipulation techniques to create and edit a part.</li> <li>▪ Create a sketch on a plane.</li> <li>▪ Create sketched features using one of three operations: cut, join, or intersect.</li> <li>▪ Create primitive features.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>

**Basic 3D  
Modeling**

**Brunswick School Department  
Grade 10-12**

**Unit 2 - Creating and Editing Sketched Features**

**Draft 2/2/15**

<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Inventor 2015 Essentials Plus</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7">https://www.youtube.com/watch?v=vnzR4KHfPFo&amp;list=PLL1op8rgVroJeM1ZMhgNsbm8m8ZfpQQxK&amp;index=7</a></li><li>○ <a href="https://www.youtube.com/watch?v=JcPeHRgh1nA">https://www.youtube.com/watch?v=JcPeHRgh1nA</a></li></ul></li></ul>

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ When creating a part, it is better to use placed features instead of sketched features.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a placed feature?</li> <li>▪ How do you create a work plane?</li> <li>▪ How do you create an offset work plane?</li> <li>▪ How do you to create a UCS?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Understand how to use fillets and chamfers.</li> <li>▪ Understand how to create a hole as a placed feature.</li> <li>▪ Shell a part.</li> <li>▪ Use pattern features.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Edge fillet</li> <li>○ Face fillet</li> <li>○ Full round fillet</li> <li>○ Chamfer</li> <li>○ Hole types</li> <li>○ Shelling</li> <li>○ Work feature</li> <li>○ Work axis</li> <li>○ Work points</li> <li>○ Work planes</li> <li>○ User coordinate system (UCS)</li> <li>○ Rectangular patterns</li> <li>○ Circular patterns</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Create fillets.</li> <li>▪ Create chamfers.</li> <li>▪ Create holes.</li> <li>▪ Create work axes.</li> <li>▪ Create work points.</li> <li>▪ Create work planes.</li> <li>▪ Create a UCS.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>

**Basic 3D  
Modeling**

**Brunswick School Department  
Grade 10-12  
Unit 3 - Creating Placed Features**

**Draft 2/2/15**

<p><b>Sample Lessons And Activities</b></p>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<p><b>Sample Classroom Assessment Methods</b></p>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<p><b>Sample Resources</b></p>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Inventor 2015 Essentials Plus</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=pksS-NNvnAU">https://www.youtube.com/watch?v=pksS-NNvnAU</a></li></ul></li></ul>

Brunswick School Department  
Grade 10-12  
Unit 4 - Creating and Editing Drawing Views

Draft 2/2/15

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ You can create drawing views at any point after a part or assembly exists. The part or assembly does not need to be complete because the part and drawing views are associative in both directions.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What are the industry standards for producing a drawing?</li> <li>▪ How is a dimension style created?</li> <li>▪ How is a text style created?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Retrieve and arrange model dimensions for use in drawing views.</li> <li>▪ Edit, move, and hide dimensions.</li> <li>▪ Add automated centerlines.</li> <li>▪ Add general, baseline, chain, and ordinate dimensions.</li> <li>▪ Add annotations such as text, leaders, Geometric Dimensioning &amp; Tolerancing (GD&amp;T), surface finish symbols, weld symbols, and datum identifiers.</li> <li>▪ Open a model from a drawing.</li> <li>▪ Open a drawing from a model.</li> <li>▪ Understand the necessary views needed to develop a drawing.</li> <li>▪ Geometric Dimensioning &amp; Tolerancing (GD&amp;T).</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Title block</li> <li>○ Border</li> <li>○ Drawing views</li> <li>○ Base view</li> <li>○ Projected view</li> <li>○ Auxiliary view</li> <li>○ Section view</li> <li>○ Broken view</li> <li>○ Multi-view drawings</li> <li>○ Detail views</li> <li>○ Hatch patterns</li> <li>○ Annotation</li> <li>○ Centerline</li> <li>○ Hidden line</li> <li>○ Baseline dimensions</li> <li>○ Chain dimensions</li> <li>○ Ordinate dimensions</li> </ul> </li> </ul>



**Basic 3D  
Modeling**

**Brunswick School Department  
Grade 10-12  
Unit 4 - Creating and Editing Drawing Views**

**Draft 2/2/15**

<b>Essential Skills</b>	<ul style="list-style-type: none"><li>▪ Create base and projected drawing views from a part.</li><li>▪ Create auxiliary, section, detail, and broken views.</li><li>▪ Create hole notes</li><li>▪ Create a hole table.</li><li>▪ Edit the properties and location of drawing views.</li><li>▪ Create and use dimensioning styles</li><li>▪ Create and use text styles.</li></ul>
<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Inventor 2015 Essentials Plus</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=t5m-Eqly5o4">https://www.youtube.com/watch?v=t5m-Eqly5o4</a></li></ul></li></ul>

Brunswick School Department  
Grade 10-12  
Unit 5 - Creating and Documenting Assemblies

Draft 2/2/15

<b>Essential Understandings</b>	<ul style="list-style-type: none"><li>▪ All of the components in an assembly are referenced in, meaning that each component exists in its own component file, and its definition is linked into the assembly.</li></ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"><li>▪ What is an assembly?</li><li>▪ How do you create a component in the context of an assembly?</li><li>▪ What is the purpose of a presentation file?</li></ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"><li>▪ Understand the assembly options.</li><li>▪ Use assembly joints to control the location and motion of components.</li><li>▪ Pattern components in an assembly.</li><li>▪ Check parts in an assembly for interference.</li><li>▪ Drive constraints.</li><li>▪ Manipulate and edit the Bill of Materials (BOM).</li></ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"><li>▪ <u>Terms:</u><ul style="list-style-type: none"><li>○ Assemblies</li><li>○ Components</li><li>○ Occurrences</li><li>○ Grounded component</li><li>○ Degrees of freedom (DOF)</li><li>○ Assembly constraints</li><li>○ Constraint limits</li><li>○ Transitional constraints</li><li>○ Assembly joints</li><li>○ Visibility control</li><li>○ Additivity</li><li>○ Adaptive sketch</li><li>○ Patterning components</li><li>○ Associative pattern</li><li>○ Rectangular pattern</li><li>○ Circular pattern</li><li>○ Center of gravity</li><li>○ Bill of material (BOM)</li><li>○ BOM editor</li><li>○ Balloons</li><li>○ Parts list</li></ul></li></ul>

**Brunswick School Department**  
**Grade 10-12**  
**Unit 5 - Creating and Documenting Assemblies**

Draft 2/2/15

<b>Essential Skills</b>	<ul style="list-style-type: none"> <li>▪ Place components into an assembly.</li> <li>▪ Create components and assemblies.</li> <li>▪ Constrain components together using assembly constraints.</li> <li>▪ Edit assembly constraints.</li> <li>▪ Create a presentation file.</li> <li>▪ Create drawing views from an assembly or presentation file.</li> <li>▪ Create individual and automatic balloons.</li> <li>▪ Create and performs edits on a parts list in a drawing.</li> </ul>
<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"> <li>▪ Written test/quizzes</li> <li>▪ Project drawings for each unit</li> <li>▪ Final project design and documentation</li> </ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ Inventor 2015 Essentials Plus</li> </ul> </li> <li>▪ <u>Videos:</u> <ul style="list-style-type: none"> <li>○ <a href="https://www.youtube.com/watch?v=cFZhubVf4t8">https://www.youtube.com/watch?v=cFZhubVf4t8</a></li> <li>○ <a href="https://www.youtube.com/watch?v=cFZhubVf4t8">https://www.youtube.com/watch?v=cFZhubVf4t8</a></li> </ul> </li> </ul>

Brunswick School Department  
Grade 10-12  
Unit 6 – Advanced Modeling Techniques

Draft 2/2/15

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ One main advantage of using parametric parts and assemblies is the ability to check for potential problems without actually creating a physical prototype. Motion analysis can also be performed to visually confirm the proper assembly of the design, and to check for any interference between mating parts and any other potential problems.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is the difference between a Model Parameter and a User Parameter?</li> <li>▪ How do you create a 3D path using geometry that intersects with a part?</li> <li>▪ How do you reorder features?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Create relationships between dimensions.</li> <li>▪ Create an equation to define a dimension's value.</li> <li>▪ Create parameters.</li> <li>▪ Create a design view representation.</li> <li>▪ Create sweep features.</li> <li>▪ Create 3D sketches.</li> <li>▪ Create coil features.</li> <li>▪ Create loft features.</li> <li>▪ Place components from the Content Center.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Model parameter</li> <li>○ User parameter</li> <li>○ Reference parameter</li> <li>○ Linked parameter</li> <li>○ Emboss text</li> <li>○ Closed profile</li> <li>○ Sweep features</li> <li>○ 3D sweep</li> <li>○ Coil features</li> <li>○ Loft features</li> <li>○ Mirror features</li> <li>○ Reordering a feature</li> <li>○ Feature rollback</li> <li>○ Content center</li> <li>○ Stress analysis</li> </ul> </li> </ul>

Brunswick School Department  
Grade 10-12  
Unit 6 – Advanced Modeling Techniques

Draft 2/2/15

<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Change the display of dimensions.</li> <li>▪ Section a part or components in an assembly.</li> <li>▪ Emboss text and close profiles.</li> <li>▪ Split a part.</li> <li>▪ Mirror model features</li> <li>▪ Suppress features of a part.</li> <li>▪ Reorder part features.</li> <li>▪ Simulate stress on a part and an assembly.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>
<p><b>Sample Lessons And Activities</b></p>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>
<p><b>Sample Classroom Assessment Methods</b></p>	<ul style="list-style-type: none"> <li>▪ Written test/quizzes</li> <li>▪ Project drawings for each unit</li> </ul>
<p><b>Sample Resources</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ Inventor 2015 Essentials Plus</li> </ul> </li> <li>▪ <u>Videos:</u> <ul style="list-style-type: none"> <li>○</li> </ul> </li> </ul>

Unit 1 - Creating and Using Blocks, the DesignCenter  
and Tool Palettes

Draft 2/2/15

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ A <i>block</i> is an AutoCAD term that refers to a pre-drawn object stored in an AutoCAD file that can be placed or inserted into a drawing whenever needed.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a block?</li> <li>▪ How are blocks used in computer-generated drawings?</li> <li>▪ What is the DesignCenter?</li> <li>▪ What is a Tool Palette?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Describe what blocks are and how they are used in technical drawings created with AutoCAD.</li> <li>▪ Describe how to use the DesignCenter.</li> <li>▪ Describe how to use Tool Palettes.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Base Point</li> <li>○ Block</li> <li>○ Block Library</li> <li>○ Insertion Point</li> <li>○ DesignCenter</li> <li>○ Tool Palette</li> <li>○ Insert</li> <li>○ Minsert</li> <li>○ Explode</li> <li>○ Wblock</li> <li>○ Bedit</li> <li>○ purge</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Create, insert, and edit blocks with AutoCAD software.</li> <li>▪ Create a block library of symbols for use in future drawings.</li> <li>▪ Utilize the DesignCenter and tool Palettes to drag and drop <i>Blocks</i> into a drawing.</li> <li>▪ Be able to convert <i>Blocks</i> to individual items with Explode.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>

**Advanced  
Drafting/CAD**

**Brunswick School Department  
Grade 10-12  
Unit 1 - Creating and Using Blocks, the DesignCenter  
and Tool Palettes**

**Draft 2/2/15**

<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ AutoCAD and It's Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=i0kYPI0v4n4">https://www.youtube.com/watch?v=i0kYPI0v4n4</a></li><li>○ <a href="https://www.youtube.com/watch?v=qTPCHUvIIVU">https://www.youtube.com/watch?v=qTPCHUvIIVU</a></li></ul></li></ul>

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ A <i>section view</i> is a type of drawing in which part of an object's exterior is removed to reveal its interior features.</li> <li>▪ In creating a section view, an imaginary <i>cutting plane</i> is used to slice through the object to reveal its interior features.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a section view?</li> <li>▪ What is a cutting plane?</li> <li>▪ What are the different types of section views?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Define what section views are.</li> <li>▪ Describe how section views are used in technical drawings.</li> <li>▪ Provide the names and descriptions of the different types of sections and the terminology associated with section views.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Broken-Out Section</li> <li>○ Cutting Plane</li> <li>○ Full Section</li> <li>○ Half Section</li> <li>○ Offset Section</li> <li>○ Removed Section</li> <li>○ Revolved Section</li> <li>○ Section</li> <li>○ Section Lines</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Use AutoCAD to create section views, including properly placing cutting plane lines and hatch patterns.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>
<p><b>Sample Lessons And Activities</b></p>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>



<p><b>Sample Classroom Assessment Methods</b></p>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<p><b>Sample Resources</b></p>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Basic Technical Drawing</li><li>○ AutoCAD and It's Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=FD9rDohYxxs">https://www.youtube.com/watch?v=FD9rDohYxxs</a></li></ul></li></ul>

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ The auxiliary view is drawn as if the viewer's line of sight were perpendicular to the inclined plane.</li> <li>▪ The features of the inclined plane will appear true size and shape in the auxiliary view.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is a primary auxiliary view?</li> <li>▪ What is a secondary auxiliary view?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Define what auxiliary views are and how they are used in technical drawings.</li> <li>▪ Explain the glass box theory of visualizing an auxiliary view.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Auxiliary views</li> <li>○ Partial auxiliary views</li> <li>○ Primary auxiliary views</li> <li>○ Secondary auxiliary views</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Use AutoCAD to create a primary auxiliary view for an inclined surface.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>
<p><b>Sample Lessons And Activities</b></p>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>
<p><b>Sample Classroom Assessment Methods</b></p>	<ul style="list-style-type: none"> <li>▪ Written test/quizzes</li> <li>▪ Project drawings for each unit</li> </ul>
<p><b>Sample Resources</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ Basic Technical Drawing</li> <li>○ AutoCAD and It's Applications: Basic</li> </ul> </li> </ul>

	<ul style="list-style-type: none"><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=vZbrcAGOB">https://www.youtube.com/watch?v=vZbrcAGOB</a> o</li><li>○ <a href="https://www.youtube.com/watch?v=Uuc3bN36SA0">https://www.youtube.com/watch?v=Uuc3bN36SA0</a></li></ul></li></ul>
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<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ Most of the objects appear to be composed of several simple objects, but each shape is actually treated by AutoCAD as one object.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ How are these commands best utilized?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Know that objects forming a closed shape can be combined into one <i>Region</i> object.</li> <li>▪ Use <i>Divide</i> to add points at equal parts of an object.</li> <li>▪ Use <i>Measure</i> to add points at specified segment lengths along an object.</li> <li>▪ Use <i>Donut</i> to create circles with width.</li> <li>▪ Draw multiple parallel lines with <i>Mline</i>.</li> <li>▪ Use the <i>Sketch</i> command to create freehand sketch lines.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Xline</li> <li>○ Ray</li> <li>○ Donut</li> <li>○ Spline</li> <li>○ Divide</li> <li>○ Measure</li> <li>○ Mline</li> <li>○ Mlstyle</li> <li>○ Sketch</li> <li>○ Region</li> <li>○ Boundary</li> <li>○ Wipeout</li> <li>○ Revcloud</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Create construction lines using the <i>Xline</i> and <i>Ray</i> commands.</li> <li>▪ Create Polygons by the <i>Circumscribe</i>, <i>Inscribe</i> and <i>Edge</i> methods.</li> <li>▪ Create spline curves passing exactly through the selected points.</li> <li>▪ Create a boundary.</li> <li>▪ Create a revision cloud.</li> </ul>

<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ AutoCAD and its Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○</li></ul></li></ul>

<b>Essential Understandings</b>	<ul style="list-style-type: none"><li>▪ Model space provides an environment to create drawing views and add dimensions and annotations directly to views. Layouts provide an effective method to display model space content using floating viewports.</li></ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"><li>▪ What is Model Space?</li><li>▪ What is Paper Space?</li><li>▪ What is a Viewport?</li><li>▪ What is the purpose of a layout?</li><li>▪ What are plot styles?</li></ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"><li>▪ Describe the purpose for and proper use of layouts.</li><li>▪ Manage layouts</li><li>▪ Add layout content.</li><li>▪ Preview and plot layouts.</li></ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"><li>▪ <u>Terms:</u><ul style="list-style-type: none"><li>○ Model</li><li>○ Paper Space</li><li>○ Model Space</li><li>○ Viewports</li><li>○ Layout</li><li>○ Floating viewport</li><li>○ Margin</li><li>○ Page setup</li><li>○ Plot device</li><li>○ Drawing scale</li><li>○ Plot style</li><li>○ Plot style table</li><li>○ Plot stamp</li><li>○ Plot spooler</li><li>○ Publishing</li></ul></li></ul>
<b>Essential Skills</b>	<ul style="list-style-type: none"><li>▪ Prepare layouts for plotting</li><li>▪ Use the <i>Page Setup Manager</i> to define plot settings</li><li>▪ Use plot styles and plot style tables</li><li>▪ Use floating viewports to create properly scaled final drawings</li></ul>

<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ AutoCAD and Its Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=Lz6piHIBn7g">https://www.youtube.com/watch?v=Lz6piHIBn7g</a></li><li>○ <a href="https://www.youtube.com/watch?v=PhJav-46eMw">https://www.youtube.com/watch?v=PhJav-46eMw</a></li><li>○ <a href="https://www.youtube.com/watch?v=VEoahd-ePB0">https://www.youtube.com/watch?v=VEoahd-ePB0</a></li></ul></li></ul>

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ Any dimension that requires a tolerance that is different from the general tolerances given in the title block or general note must have the specific tolerance applied directly to the dimension on the drawing.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What is the purpose of geometric dimensioning and tolerancing?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Define and use dimensioning and tolerancing terminology.</li> <li>▪ Explain the purpose of geometric dimensioning and tolerancing (GD&amp;T)</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Counterbore</li> <li>○ Spotface</li> <li>○ Countersink</li> <li>○ Repetitive features</li> <li>○ Fillets</li> <li>○ Rounds</li> <li>○ Leader line</li> <li>○ Annotation</li> <li>○ Multileader style</li> <li>○ Shoulder</li> <li>○ Chamfer</li> <li>○ Rectangular coordinate dimensioning without dimension lines</li> <li>○ Datum</li> <li>○ Tabular dimensioning</li> <li>○ Chart dimensioning</li> <li>○ Ordinate dimensioning</li> <li>○ Tolerance</li> <li>○ Bilateral tolerance</li> <li>○ Unilateral tolerance</li> <li>○ Geometric dimensioning &amp; tolerancing (GD&amp;T)</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Create and use multileader styles.</li> <li>▪ Apply alternate dimensioning practices.</li> <li>▪ Create and use specified tolerance dimension styles.</li> <li>▪ Specify an appropriate tolerance method.</li> </ul>



<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"><li>▪ Software walk-thru and demonstrations</li><li>▪ Practice exercises</li><li>▪ Vocabulary crosswords</li></ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ Basic Technical Drawing</li><li>○ AutoCAD and Its Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v=xOOucvXuEg">https://www.youtube.com/watch?v=xOOucvXuEg</a></li></ul></li></ul>

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ Annotations and related items, such as dimension and hatch objects, must be scaled so that information appears on-screen and plots correctly relative to scaled objects.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What are annotative objects?</li> <li>▪ What is an annotative object representation?</li> <li>▪ Why is it important for the viewport scale to match the annotation scale?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Explain the practical differences between manual and annotative object scaling.</li> <li>▪ Create and use annotative objects in model space.</li> <li>▪ Adjust the scale of annotations according to a new drawing scale.</li> <li>▪ Identify at least four types of objects that can be made annotative.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Annotations</li> <li>○ Annotative objects</li> <li>○ Scale</li> <li>○ Annotations scale</li> <li>○ Schematic block</li> <li>○ Annotative object representation</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Specify objects as annotative.</li> <li>▪ Display annotative objects in scaled layout viewports.</li> <li>▪ Use annotative objects to help prepare multi-view drawings.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p>See attached sheets</p>
<p><b>Sample Lessons And Activities</b></p>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>

<p><b>Sample Classroom Assessment Methods</b></p>	<ul style="list-style-type: none"><li>▪ Written test/quizzes</li><li>▪ Project drawings for each unit</li></ul>
<p><b>Sample Resources</b></p>	<ul style="list-style-type: none"><li>▪ <u>Publications:</u><ul style="list-style-type: none"><li>○ AutoCAD and Its Applications: Basic</li></ul></li><li>▪ <u>Videos:</u><ul style="list-style-type: none"><li>○ <a href="https://www.youtube.com/watch?v= am94icU2t4">https://www.youtube.com/watch?v= am94icU2t4</a></li></ul></li></ul>

<b>Essential Understandings</b>	<ul style="list-style-type: none"> <li>▪ Taking measurements from a drawing is common during the designing and drafting processes.</li> </ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>▪ What are the applications of the <i>MEASUREGEOM</i> command?</li> <li>▪ What does the <i>QuickCalc</i> palette do?</li> </ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"> <li>▪ List data related to a single point, an object, a group of objects, or an entire drawing.</li> <li>▪ Perform calculations using the <i>QuickCalc</i> palette.</li> <li>▪ Calculate the <i>Area</i> of an object.</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Variable</li> <li>○ Constant</li> <li>○ Function</li> </ul> </li> </ul>
<b>Essential Skills</b>	<ul style="list-style-type: none"> <li>▪ Measure distance. Radius, diameter, angles, and area.</li> <li>▪ Determine the drawing status.</li> <li>▪ Determine the amount of time spent in a drawing session.</li> </ul>
<b>Related Maine Learning Results</b>	See attached sheets
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Software walk-thru and demonstrations</li> <li>▪ Practice exercises</li> <li>▪ Vocabulary crosswords</li> </ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"> <li>▪ Written test/quizzes</li> <li>▪ Project drawings for each unit</li> </ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ AutoCAD and Its Applications: Basic</li> </ul> </li> <li>▪ <u>Videos:</u></li> </ul>