

**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 1    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Matter and Change  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>•</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What are the properties of matter?</li><li>• What is chemistry?</li><li>• What are the different branches of chemistry?</li><li>• What are major physical and chemical changes that matter can undergo?</li><li>• How is matter classified?</li><li>• How is the periodic table used to classify elements?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Chemistry</li><li>• Matter</li><li>• Physical Change and Chemical Change</li></ul>  |   |

- Mixture vs. Pure Substance
- Periodic Table

**Student Learning Tasks and Opportunities:**

- The student will be able to define chemistry.
- The student will be able to distinguish between the different branches of Chemistry.
- The student will be able to compare and contrast physical and chemical changes.
- The student will be able to classify matter.
- The student will recognize similarities and differences of elements on the periodic table.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects

**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 1    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Measurements and Calculations  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>•</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is the scientific method?</li><li>• What are SI units of measurement?</li><li>• What are mass and density?</li><li>• What are conversion factors and how are they used?</li><li>• How are measurements used in problem solving?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Mass</li><li>• Volume</li><li>• Density</li><li>• Scientific Method</li></ul>   |   |

- Accuracy and Precision
- Percent Error
- Significant Figures
- Scientific Notation
- Problem Solving Strategies

**Student Learning Tasks and Opportunities:**

- Students will use the scientific method in performing experiments.
- Students will utilize SI units of measurement.
- Students will be able to use conversion factors in dimensional analysis.
- Students will be able to solve for density and describe its relationship to mass and volume.
- Students will be able to properly demonstrate importance of accurate measurements in problem solving.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects

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**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 1    **Period(s):**

|   |   |
|---|---|
| <b>Topic:</b> Atoms   |   |
| <p><b>21<sup>st</sup> Century Graduation Expectation(s):</b></p> <ul style="list-style-type: none"> <li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li> <li>• 1.2 Analyzing and evaluating information</li> <li>• 1.3 Applying technology as a learning tool across all disciplines</li> <li>• 2.1 Working cooperatively and/or independently</li> <li>• 2.2 Applying problem solving strategies</li> <li>• 2.3 Utilizing resources and time effectively</li> <li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li> <li>• 3.1 Making informed life and career decisions</li> <li>• 3.2 Recognizing and respecting the diversity and individuality of others</li> <li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li> <li>• 4.1 Reading widely and critically</li> <li>• 4.2 Writing clearly, concisely, and persuasively</li> <li>• 4.3 Speaking, listening, and interpreting effectively</li> </ul> |   |
| <p><b>Next Generation Science Standards:</b></p> <ul style="list-style-type: none"> <li>• HS-PS 1-7</li> </ul>  | <p><b>Common Core State Standards:</b></p> <ul style="list-style-type: none"> <li>• RST.11-12.1                      • WHST.11-12.1</li> <li>• RST.11-12.2                      • WHST.11-12.2</li> <li>• RST.11-12.3                      • WHST.11-12.4</li> <li>• RST.11-12.4                      • WHST.11-12.5</li> <li>• RST.11-12.5                      • WHST.11-12.6</li> <li>• RST.11-12.6                      • WHST.11-12.7</li> <li>• RST.11-12.7                      • WHST.11-12.9</li> <li>• RST.11-12.8                      • WHST.11-12.10</li> <li>• RST.11-12.9</li> <li>• RST.11-12.10</li> </ul> |
| <p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• What is the history behind modern atomic theory?</li> <li>• What experiments lead to the discovery of the electron and nucleus?</li> <li>• What are the principle properties of subatomic particles?</li> <li>• What are the concepts of atomic number, atomic mass and moles?</li> </ul>   |   |
| <p><b>Content Topics:</b></p> <ul style="list-style-type: none"> <li>• Law of conservation of mass, definite proportions and multiple proportions.</li> <li>• Dalton’s atomic theory.</li> <li>• Cathode Ray experiment</li> <li>• Rutherford’s Experiment</li> <li>• Nuclear Forces</li> </ul>   |   |

- Atomic Number
- Mass Number
- Isotopes
- Mole Concepts

**Student Learning Tasks and Opportunities:**

- Students should be able to compare Dalton's atomic theory and modern atomic theory.
- Students should be able to use the Law of Conservation of Mass.
- Students should be able to describe Cathode Ray experiment and explain its findings.
- Students should be able to describe Rutherford's experiment and explain its findings.
- Students should be able to identify atomic number and atomic mass.
- Students should be able to identify the different isotopes for an atom.
- Students should be able to use Avogadro's Number in mole concept calculations.

**Instructional Resources and Equipment:**

- Student Text
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- Interactive whiteboard
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**Assessment Task(s):**

- Entrance/ exit slips, etc.
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**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 1    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Arrangement of Electrons in Atoms  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 4-1</li><li>• HS-PS 4-2</li><li>• HS-PS 4-3</li><li>• HS-PS 4-4</li><li>• HS-PS 4-5</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is electromagnetic radiation?</li><li>• What is the Bohr model of the atom?</li><li>• What are the basics of quantum theory?</li><li>• What is electron configuration and how is it used to identify electrons?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Electromagnetic Radiation / Electromagnetic Spectrum</li><li>• Frequency and Wave Length</li><li>• Photoelectric Effect</li><li>• Bohr Model of the Atom</li><li>• Quantum Model of the Atom</li></ul>  |   |

- Electron Configuration
- Orbital Notation

**Student Learning Tasks and Opportunities:**

- Students will be able to describe principles of electromagnetic radiation.
- Students will be able to explain the development of the Bohr model of the atom.
- Students will be able to describe the location of electrons around the nucleus using quantum theory.
- Students will be able to determine the electron configuration for elements.
- Students will be able to determine the orbital notation for elements.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
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**North Providence High School Science Department**  
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**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 2    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Periodic Law   |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-1</li><li>• HS-PS 2-6</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• How was the modern periodic table developed?</li><li>• What is the periodic law?</li><li>• How does the periodic law predict properties of elements?</li><li>• What is the relationship between electron configuration and the placement of an element in the table?</li><li>• What are the trends for atomic radii?</li><li>• What are the trends for ionization energy?</li><li>• What are the trends for electron affinity?</li><li>• What are the trends for ionic radii?</li><li>• What are the trends for electronegativity?</li></ul>   |   |
|  |   |

**Content Topics:**

- Periodic table
- Periodic Law
- Electron configuration
- Periodic trends

**Student Learning Tasks and Opportunities:**

- Students will identify contributing factors to the creation of the modern day periodic table.
- Students will explain how the periodic law is used to predict an elements properties.
- Students will describe the relationship between electron configuration and location of an element.
- Students will demonstrate how periodic law determines periodic trends.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
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- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
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- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
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**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 2    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Chemical Bonding   |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-1</li><li>• HS-PS 1-3</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is chemical bonding?</li><li>• What are the different types of chemical bonds?</li><li>• What are the characteristics of covalent bonding?</li><li>• What are the characteristics of ionic bonding?</li><li>• What are the characteristics of metallic bonding?</li><li>• How can you identify the geometry of a molecule?</li></ul>  |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Chemical bonds</li><li>• Polar-covalent and non-polar covalent bonds</li><li>• Ionic bonding</li></ul>  |   |

- Metallic bonding
- Molecular geometry
- VSEPR theory

**Student Learning Tasks and Opportunities:**

- Students will identify bond types.
- Students will compare and contrast covalent, ionic and metallic bonds.
- Students will be able to draw Lewis structures.
- Students will identify the geometry of molecules.
- Students will identify the hybridization within molecules.

**Instructional Resources and Equipment:**

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- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
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- Presentations/projects

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**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 2    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Chemical Formulas  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-1</li><li>• HS-PS 1-2</li><li>• HS-PS 1-3</li><li>• HS-PS 1-7</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is the significance of a chemical formula?</li><li>• How do you name binary and molecular compounds?</li><li>• How are oxidation numbers and the Stock system used in naming compounds?</li><li>• What are molar mass and percent composition?</li><li>• What are empirical and molecular formulas?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Chemical formulas</li><li>• Binary ionic and molecular compounds</li><li>• Oxidation numbers</li><li>• Stock system</li></ul>   |   |

- Molar mass
- Percent composition
- Empirical and molecular formulas

**Student Learning Tasks and Opportunities:**

- Students will be able to name chemical compounds.
- Students will be able to write chemical formulas.
- Students will identify oxidation states of elements.
- Students will calculate molar masses and percent composition.
- Students will determine empirical and molecular formulas.

**Instructional Resources and Equipment:**

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**Assessment Task(s):**

- Entrance/ exit slips, etc.
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**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 3    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Chemical Equations and Reactions   |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-1</li><li>• HS-PS 1-2</li><li>• HS-PS 1-4</li><li>• HS-PS 1-5</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is a chemical equation?</li><li>• How do you balance an equation?</li><li>• What are the five types of reactions?</li><li>• How is the activity series used in writing equations?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Chemical equations</li><li>• Phase symbols</li><li>• Types of reactions</li><li>• Activity series</li></ul>   |   |

**Student Learning Tasks and Opportunities:**

- Students will write chemical equations.
- Students will balance chemical equations.
- Students will identify and predict products for reactions.
- Students will understand how the activity series is used in predicting products of a reaction.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects



**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 3    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Stoichiometry  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-1</li><li>• HS-PS 1-2</li><li>• HS-PS 1-7</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is mole ratio?</li><li>• What are the four types of stoichiometry problems?</li><li>• How do we solve the four types of stoichiometry problems?</li><li>• What limiting reactant?</li><li>• How is percent yield calculated?</li></ul>  |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Mole ratio</li><li>• Molar mass</li><li>• Stoichiometric conversions</li><li>• Limiting and excess reactants</li><li>• Percent yield</li></ul>  |   |

**Student Learning Tasks and Opportunities:**

- Students will identify stoichiometry problems.
- Students will solve stoichiometric calculations.
- Students will identify limiting and excess reactants.
- Students will be able to calculate percent yield.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects

**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 3    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Physical Characteristics of Gases  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-3</li><li>• HS-PS 3-2</li><li>• HS-PS 3-4</li><li>• HS-PS 3-5</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is the kinetic-molecular theory?</li><li>• What is pressure and how is it measured?</li><li>• What is the Kelvin scale?</li><li>• How are pressure, volume and temperature related?</li><li>• What are the gas laws?</li></ul>  |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Kinetic-molecular theory</li><li>• Ideal gas</li><li>• Pressure and units</li><li>• Combined gas law</li><li>• Dalton's Law</li></ul>   |   |

**Student Learning Tasks and Opportunities:**

- Students will be able to explain the kinetic-molecular theory.
- Students will identify properties of an ideal gas.
- Students will explain pressure.
- Students will be able to determine the relationship between pressure, volume and temperature.
- Students will be able to use Dalton's law with other gas laws.

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
- Charts & Graphs
- Labs and demonstrations
- Simulated demonstrations
- PowerPoint presentations
- Interactive whiteboard
- Video clips
- Documentaries

**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects

**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 4    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Molecular Composition of Gases   |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>• HS-PS 1-3</li><li>• HS-PS 1-7</li><li>• HS-PS 3-2</li><li>• HS-PS 3-4</li><li>• HS-PS 3-5</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What is Avogadro’s law?</li><li>• What is molar volume of a gas?</li><li>• What is the Ideal gas law?</li><li>• What is the relationship between moles and volume of gas in stoichiometric calculations?</li><li>• How does the mass of a gas determine the rate of effusion?</li></ul>  |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Avogadro’s law</li><li>• Ideal gas law and ideal gas constant</li><li>• Mole and volume relationship of gases</li><li>• Rates of effusion</li></ul>   |   |

**Student Learning Tasks and Opportunities:**

- Students will identify the relationship between Avogadro's law and molar volume of a gas.
- Students will derive the Ideal gas law.
- Students will be able to solve problems using the ideal gas law
- Students will be able to solve stoichiometric calculations involving gases.
- Students will compare the rates of effusion for gases.

**Instructional Resources and Equipment:**

- Student Text
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- Video clips
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**Assessment Task(s):**

- Entrance/ exit slips, etc.
- Class discussions
- Homework
- Quizzes
- Lab activities/reports
- Teacher generated tests
- Presentations/projects

**North Providence High School Science Department**  
**Standards – Based Instructional Curriculum Guide**

**Course:** Chemistry    **Grade Level:** 11    **Quarter:** 4    **Period(s):**

|  |   |
|--|---|
| <b>Topic:</b> Solutions  |   |
| <b>21<sup>st</sup> Century Graduation Expectation(s):</b> <ul style="list-style-type: none"><li>• 1.1 Acquiring and applying knowledge within and across the curriculum</li><li>• 1.2 Analyzing and evaluating information</li><li>• 1.3 Applying technology as a learning tool across all disciplines</li><li>• 2.1 Working cooperatively and/or independently</li><li>• 2.2 Applying problem solving strategies</li><li>• 2.3 Utilizing resources and time effectively</li><li>• 2.4 Accessing, compiling, interpreting, and presenting data and information</li><li>• 3.1 Making informed life and career decisions</li><li>• 3.2 Recognizing and respecting the diversity and individuality of others</li><li>• 3.3 Understanding and accepting the benefits and consequences of his/her behavior</li><li>• 4.1 Reading widely and critically</li><li>• 4.2 Writing clearly, concisely, and persuasively</li><li>• 4.3 Speaking, listening, and interpreting effectively</li></ul> |   |
| <b>Next Generation Science Standards:</b> <ul style="list-style-type: none"><li>•</li></ul>  | <b>Common Core State Standards:</b> <ul style="list-style-type: none"><li>• RST.11-12.1</li><li>• RST.11-12.2</li><li>• RST.11-12.3</li><li>• RST.11-12.4</li><li>• RST.11-12.5</li><li>• RST.11-12.6</li><li>• RST.11-12.7</li><li>• RST.11-12.8</li><li>• RST.11-12.9</li><li>• RST.11-12.10</li><li>• WHST.11-12.1</li><li>• WHST.11-12.2</li><li>• WHST.11-12.4</li><li>• WHST.11-12.5</li><li>• WHST.11-12.6</li><li>• WHST.11-12.7</li><li>• WHST.11-12.9</li><li>• WHST.11-12.10</li></ul> |
| <b>Essential Question(s):</b> <ul style="list-style-type: none"><li>• What distinguishes solutions from suspensions and colloids?</li><li>• What is solubility?</li><li>• What are the chemical and physical factors that affect solubility?</li><li>• What is molarity?</li><li>• What is molality?</li></ul>   |   |
| <b>Content Topics:</b> <ul style="list-style-type: none"><li>• Types of mixtures</li><li>• Solubility</li><li>• Types of solutions</li><li>• Molarity</li><li>• Molality</li></ul>   |   |

**Student Learning Tasks and Opportunities:**

- Students will describe the differences between solutions, suspensions and colloids.
- Students will identify physical and chemical factors that affect solubility.
- Students will be able to distinguish between molarity and molality.
- Students will be able to solve problems using molarity and molality?

**Instructional Resources and Equipment:**

- Student Text
- Complimentary Texts
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**Assessment Task(s):**

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- Presentations/projects