Mapping Your Future Curriculum Matrix

Next Generation Science Standards

Unit I: Biotechnology and its Applications

Next Generation Science Standards

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
- HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Reading Standards for Informational Text 1, 2, 3, 4, 5, 6, and 7 for Sixth grade to Twelfth grade

Activity: Biotechnology Timeline

Next Generation Science Standards

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
- HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Speaking and Listening Standards 1, 2, 4, and 6 for Sixth grade to Twelfth grade
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Activity: Create a Logo

Next Generation Science Standards

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Speaking and Listening Standards 1, 2, 3, 4, 5, and 6 for Sixth grade to Twelfth grade

Activity: Make a Yeast Incubator

Next Generation Science Standards

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Speaking and Listening Standards 1, 2, and 4 for Sixth grade to Twelfth grade

Activity: DNA Extraction from Yeast

Next Generation Science Standards

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
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Unit II: Drug Discovery and Manufacturing

Next Generation Science Standards
- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
- HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects
- Reading Standards for Informational Text 1, 2, 3, 4, 5, 6, and 7 for Sixth grade to Twelfth grade

Activity: New Drug Development

Next Generation Science Standards
- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
- HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
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Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects
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**Activity: Say What You Do and Do What You Say**

*Next Generation Science Standards*

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
- HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
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*Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*

- Writing Standards 2 for Sixth grade to Twelfth grade
- Speaking and Listening Standards 1, 3, 4, and 6 for Sixth grade to Twelfth grade

**Unit III: Career Opportunities**

*Next Generation Science Standards*

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.

*Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*

- Reading Standards for Informational Text 1, 2, 3, 4, 5, 6, and 7 for Sixth grade to Twelfth grade

**Activity: A Day in the Life of Six Biomanufacturing Employees**

*Next Generation Science Standards*

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.

*Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*

- Reading Standards for Informational Text 1, 2, and 3 for Sixth grade to Twelfth grade
- Writing Standards 1 and 2 for Sixth grade to Twelfth grade
- Speaking and Listening Standards 1, 2, 4, and 6 for Sixth grade to Twelfth grade

**Activity: Selecting a Bioscience Career**

*Next Generation Science Standards*

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraint for solutions that account for societal needs and wants.
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Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Reading Standards for Informational Text 1, 2, and 3 for Sixth grade to Twelfth grade
- Speaking and Listening Standards 1, 2, 4, and 6 for Sixth grade to Twelfth grade

Unit IV: Getting a Job and Getting Ahead

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Reading Standards for Informational Text 1, 2, 3, 4, 5, 6, and 7 for Sixth grade to Twelfth grade

Activity: The Biomanufacturing Facility

Next Generation Science Standards

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Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

- Writing Standards 2 for Sixth grade to Twelfth grade
- Speaking and Listening Standards 1, 2, 4, and 6 for Sixth grade to Twelfth grade