<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>28 Days</th>
<th>Sept. 8 - Oct. 16, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td># Class Periods</td>
<td>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The bold face words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will:</td>
</tr>
</tbody>
</table>

**Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1A** Apply mathematics to problems arising in everyday life, society, and the workplace.
- **AQR.1B** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **AQR.1D** Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- **AQR.1E** Create and use representations to organize, record, and communicate mathematical ideas.
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.
- **AQR.1G** Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Supporting resources for the course were developed by the University of Texas Dana Center as Advanced Mathematical Decision Making (AMDM). Request to download files from [www.utdanacenter.org/amdm](http://www.utdanacenter.org/amdm). Reusable student books may also be ordered for a fee at this web address.
## Cycle 1

**28 Days**  
Sept. 8 - Oct. 16, 2020

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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<th>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</th>
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</table>
| **Unit 1: Decision Making in Finance: Future Value of Investments**  
Students study future value in order to build investments. | 4 class periods (90-min. each)  
or 8 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1A** Apply mathematics to problems arising in everyday life, society, and the workplace.  
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.  

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:  
- **AQR.3F** Create, represent, and analyze mathematical models for various types of income calculations to determine the best option for a given situation.  |
| **Unit 2: Decision Making in Finance: Present Value of Investments**  
Students study present value to build investments. | 3 class periods (90-min. each)  
or 6 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1B** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.  
- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:  
- **AQR.3F** Create, represent, and analyze mathematical models for various types of income calculations to determine the best option for a given situation.  
- **AQR.3H** Create, represent, and analyze mathematical models and appropriate representations, including formulas and amortization tables, for various types of loans and investments to determine the best option for a given situation.  |
### Cycle 1
**28 Days**  
Sept. 8 - Oct. 16, 2020

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</table>
| **Unit 3: Building an Investment** Students examine the expected value of an investment based on the probability of future value. | 3 class periods (90-min. each) or 6 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1A** Apply mathematics to problems arising in everyday life, society, and the workplace.  
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.  
  
**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:  
- **AQR.3H** Create, represent, and analyze mathematical models and appropriate representations, including formulas and amortization tables, for various types of loans and investments to determine the best option for a given situation. |
## Cycle 1

**28 Days**  
Sept. 8 - Oct. 16, 2020  

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

### Unit

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<tr>
<th>Unit</th>
<th># Class Periods</th>
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<tbody>
<tr>
<td>Unit 4: Using Credit</td>
<td>4 class periods (90-min. each) or 8 class periods (45-min. each)</td>
</tr>
</tbody>
</table>

Students analyze real-world scenarios involving credit card debt, financing, and budgeting.  
(continues in Cycle 2)

### Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)

The **bold face** words in the TEKS SEs indicate concepts addressed specially in this unit, the **unbolded** concepts are addressed in other units of this course.

The student will:

### Mathematical Process Standards

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.

### Algebraic Reasoning (Expressions, Equations, and Generalized Relationships)

The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- **AQR.3F** Create, represent, and analyze mathematical models for various types of income calculations to determine the best option for a given situation.

- **AQR.3G** Create, represent, and analyze mathematical models for expenditures, including those involving credit, to determine the best option for a given situation.

- **AQR.3H** Create, represent, and analyze mathematical models and appropriate representations, including formulas and amortization tables, for various types of loans and investments to determine the best option for a given situation.
## Cycle 2

<table>
<thead>
<tr>
<th>Unit</th>
<th># Class Periods</th>
<th>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4: Using Credit</td>
<td>4 class periods (90-min. each) or 8 class periods (45-min. each)</td>
<td>The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</td>
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</table>

**The student will:**

### Mathematical Process Standards.

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.

### Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).

The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- **AQR.3F** Create, represent, and analyze mathematical models for various types of income calculations to determine the best option for a given situation.

- **AQR.3G** Create, represent, and analyze mathematical models for expenditures, including those involving credit, to determine the best option for a given situation.

- **AQR.3H** Create, represent, and analyze mathematical models and appropriate representations, including formulas and amortization tables, for various types of loans and investments to determine the best option for a given situation.
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<tr>
<th>Cycle 2</th>
<th>29 Days</th>
<th>Oct. 19 - Dec. 4, 2020</th>
<th>The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</th>
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</table>
| **Unit** | **# Class Periods** | **Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)** | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
**AQR.1B** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.  
**AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
**AQR.2A** Use precision and accuracy in real-life situations related to measurement and significant figures.  
**AQR.2C** Solve problems involving quantities that are not easily measured using proportionality.  
**AQR.2E** Solve problems involving large quantities using combinatorics.  
**Probabilistic and Statistical Reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:  
**AQR.4A** Use a two-way frequency table as a sample space to identify whether two events are independent and to interpret the results.  
**AQR.4C** Calculate conditional probabilities and probabilities of compound events using tree diagrams, Venn diagrams, area models, and formulas.  
**AQR.4D** Interpret conditional probabilities and probabilities of compound events by analyzing representations to make decisions in problem situations. |
| **Unit 5: Analysis of Numerical Data by Estimating Large Numbers** | 2 class periods (90-min. each) or 4 class periods (45-min. each) | The **bold face** words in the TEKS SEs indicate concepts addressed specially in this unit, the **unbolded** concepts are addressed in other units of this course. The student will: | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
**AQR.1B** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.  
**AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
**AQR.2A** Use precision and accuracy in real-life situations related to measurement and significant figures.  
**AQR.2C** Solve problems involving quantities that are not easily measured using proportionality.  
**AQR.2E** Solve problems involving large quantities using combinatorics.  
**Probabilistic and Statistical Reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:  
**AQR.4A** Use a two-way frequency table as a sample space to identify whether two events are independent and to interpret the results.  
**AQR.4C** Calculate conditional probabilities and probabilities of compound events using tree diagrams, Venn diagrams, area models, and formulas.  
**AQR.4D** Interpret conditional probabilities and probabilities of compound events by analyzing representations to make decisions in problem situations. |
| Cycle 2 | 29 Days Oct. 19 - Dec. 4, 2020 | The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents. |

| Unit | # Class Periods | Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs) The bold face words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will: |

| Unit 6: Ratios and Numerical Data Students analyze numerical data using ratios. | 3 class periods (90-min. each) or 6 class periods (45-min. each) | Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1E** Create and use representations to organize, record, and communicate mathematical ideas.  
- **AQR.1G** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.  

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
- **AQR.2B** Apply and analyze published ratings, weighted averages, and indices to make formal decisions. |

| Unit 7: Indices Using Weighted Sums and Averages Students analyze numerical data by using weighted sums and weighted averages. | 2 class periods (90-min. each) or 4 class periods (45-min. each) | Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
- **AQR.1E** Create and use representations to organize, record, and communicate mathematical ideas.  

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
- **AQR.2B** Apply and analyze published ratings, weighted averages, and indices to make formal decisions.  
- **AQR.2F** Use arrays to efficiently manage large collections of data and add, subtract, and multiply matrices to solve applied problems, including geometric transformations. |
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<th>29 Days</th>
<th>Oct. 19 - Dec. 4, 2020</th>
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<td><strong># Class Periods</strong></td>
<td><strong>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</strong></td>
<td><strong>The student will:</strong></td>
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</tbody>
</table>
| Unit 8: Identification Numbers | 2 class periods (90-min. each) or 4 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- AQR.1E Create and use representations to organize, record, and communicate mathematical ideas.  
- AQR.1F Analyze mathematical relationships to connect and communicate mathematical ideas. | **Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
AQR.2E Solve problems involving large quantities using combinatorics.  
AQR.2F Use arrays to efficiently manage large collections of data and add, subtract, and multiply matrices to solve applied problems, including geometric transformations. |
| **Unit 9: Probability Using Diagrams** | 4 class periods (90-min. each) or 8 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- AQR.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.  
- AQR.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. | **Probabilistic and Statistical Reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:  
AQR.4A Use a two-way frequency table as a sample space to identify whether two events are independent and to interpret the results.  
AQR.4C Calculate conditional probabilities and probabilities of compound events using tree diagrams, Venn diagrams, area models, and formulas.  
AQR.4D Interpret conditional probabilities and probabilities of compound events by analyzing representations to make decisions in problem situations. |
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<td>Unit</td>
<td>Dec. 7, 2020 - Jan. 29, 2021</td>
<td>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs) The bold face words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will:</td>
</tr>
<tr>
<td>Unit 10: Decisions Based on Probabilities</td>
<td>3 class periods (90-min. each) or 6 class periods (45-min. each)</td>
<td>Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</td>
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<td></td>
<td>☑️ AQR.1E Create and use representations to organize, record, and communicate mathematical ideas.</td>
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<tr>
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<td></td>
<td>☑️ AQR.1F Analyze mathematical relationships to connect and communicate mathematical ideas.</td>
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<td>Numeric Reasoning. The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:</td>
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<td></td>
<td>• AQR.2E Solve problems involving large quantities using combinatorics.</td>
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<td>Probabilistic and Statistical Reasoning. The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:</td>
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<td>AQR.4B Use the Addition Rule, ( P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B) ), in mathematical and real-world problems.</td>
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<tr>
<td></td>
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<td>AQR.4E Use probability to make and justify decisions about risks in everyday life.</td>
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<td>AQR.4F Calculate expected value to analyze mathematical fairness, payoff, and risk.</td>
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</tbody>
</table>
### Cycle 3

**Unit 11: Probability with Expected Value**  
Students analyze expected value for mathematical fairness.

| # Class Periods                                      |  
|------------------------------------------------------|------------------------------------------------------|
| 2 class periods (90-min. each)                       | Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
| or                                                   | ☀️ AQR.1A Apply mathematics to problems arising in everyday life, society, and the workplace.  
| 4 class periods (45-min. each)                       | ☀️ AQR.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  

**Probabilistic and Statistical Reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:  
AQR.4F Calculate expected value to analyze mathematical fairness, payoff, and risk.
## Cycle 3

### Unit
**Unit 12: Statistical Studies and Investigations**
Through various methods of investigating data, students analyze data studies for accuracy and bias.

<table>
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<tr>
<th># Class Periods</th>
<th>28 Days Dec. 7, 2020 - Jan. 29, 2021</th>
</tr>
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<tbody>
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<td>3 class periods (90-min. each)</td>
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<tr>
<td>or 6 class periods (45-min. each)</td>
<td>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs) The <strong>bold face</strong> words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will:</td>
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### Mathematical Process Standards.
The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1E** Create and use representations to organize, record, and communicate mathematical ideas.
- **AQR.1G** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

### Probabilistic and Statistical Reasoning.
The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:

- **AQR.4G** Determine the validity of logical arguments that include compound conditional statements by constructing truth tables.
- **AQR.4H** Identify limitations or lack of information in studies reporting statistical information, including when studies are reported in condensed form.
- **AQR.4I** Interpret and compare the results of polls, given a margin of error.
- **AQR.4J** Identify potential misuses of statistics to justify particular conclusions, including assertions of a cause-and-effect relationship rather than an association, and missteps or fallacies in logical reasoning.
- **AQR.4K** Describe strengths and weaknesses of sampling techniques, data and graphical displays, and interpretations of summary statistics and other results appearing in a study, including reports published in media.
- **AQR.4L** Determine the need for and purpose of a statistical investigation and what type of statistical analysis can be used to answer a specific question or set of questions.
- **AQR.4M** Identify the population of interest for a statistical investigation, select an appropriate sampling technique, and collect data.
- **AQR.4N** Identify the variables to be used in a study.
- **AQR.4O** Determine possible sources of statistical bias in a study and how bias may affect the validity of the results.
- **AQR.4Q** Analyze possible sources of data variability, including those that can be controlled and those that cannot be controlled.
- **AQR.4S** Justify the design and the conclusion(s) of statistical studies, including the methods used.
<table>
<thead>
<tr>
<th>Unit</th>
<th># Class Periods</th>
<th>Mathematics – Advanced Quantitative Reasoning (AQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 13: Analyzing Data</td>
<td>4 class periods (90-min. each) or 8 class periods (45-min. each)</td>
<td>Students analyze the appropriateness and usefulness of graphical displays.</td>
</tr>
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<td><strong>Mathematical Process Standards.</strong> The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</td>
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<td></td>
<td>- <strong>AQR.1A</strong> Apply mathematics to problems arising in everyday life, society, and the workplace.</td>
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<td>- <strong>AQR.1D</strong> Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</td>
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<td>- <strong>AQR.1E</strong> Create and use representations to organize, record, and communicate mathematical ideas.</td>
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<td><strong>Numeric Reasoning.</strong> The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:</td>
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<tr>
<td></td>
<td></td>
<td>- <strong>AQR.2G</strong> Analyze various voting and selection processes to compare results in given situations.</td>
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<td><strong>Probabilistic and Statistical Reasoning.</strong> The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:</td>
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<td></td>
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<td>- <strong>AQR.4I</strong> Interpret and compare the results of polls, given a margin of error.</td>
</tr>
<tr>
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<td></td>
<td>- <strong>AQR.4J</strong> Identify potential misuses of statistics to justify particular conclusions, including assertions of a cause-and-effect relationship rather than an association, and missteps or fallacies in logical reasoning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>AQR.4K</strong> Describe strengths and weaknesses of sampling techniques, data and graphical displays, and interpretations of summary statistics and other results appearing in a study, including reports published in media.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>AQR.4P</strong> Create data displays for given data sets to investigate, compare, and estimate center, shape, spread, and unusual features of the data.</td>
</tr>
<tr>
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<td>- <strong>AQR.4R</strong> Report results of statistical studies, including selecting an appropriate presentation format, creating graphical data displays, and interpreting results in terms of the question studied.</td>
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<td>- <strong>AQR.4S</strong> Justify the design and the conclusion(s) of statistical studies, including the methods used for each.</td>
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<td>- <strong>AQR.4T</strong> Communicate statistical results in oral and written formats using appropriate statistical and nontechnical language.</td>
</tr>
</tbody>
</table>
### Cycle 4  
**29 Days**  
Feb. 1 - Mar. 12, 2021

<table>
<thead>
<tr>
<th>Unit</th>
<th># Class Periods</th>
<th>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</th>
<th>Mathematical Process Standards</th>
<th>Probabilistic and Statistical Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 14: Statistical Studies: Source of Variability</td>
<td>3 class periods (90-min. each) or 6 class periods (45-min. each)</td>
<td>The bold face words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. <strong>The student will:</strong></td>
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</tbody>
</table>

#### Mathematical Process Standards
- The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
  - **AQR.1B** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
  - **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

#### Probabilistic and Statistical Reasoning
- The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:
  - **AQR.4J** Identify potential misuses of statistics to justify particular conclusions, including assertions of a cause-and-effect relationship rather than an association, and missteps or fallacies in logical reasoning.
  - **AQR.4K** Describe strengths and weaknesses of sampling techniques, data and graphical displays, and interpretations of summary statistics and other results appearing in a study, including reports published in media.
  - **AQR.4O** Determine possible sources of statistical bias in a study and how bias may affect the validity of the results.
  - **AQR.4Q** Analyze possible sources of data variability, including those that can be controlled and those that cannot be controlled.
Cycle 4 | 29 Days
Feb. 1 - Mar. 12, 2021

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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**Unit 15: Recursion in Modeling: Relationships in Data**
Students study recursion relationships in data and various representations from linear models.

<table>
<thead>
<tr>
<th>2 class periods (90-min. each)</th>
<th>Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</th>
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<tbody>
<tr>
<td>or</td>
<td>☑ AQR.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</td>
</tr>
<tr>
<td>4 class periods (45-min. each)</td>
<td>☑ AQR.1G Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</td>
</tr>
</tbody>
</table>

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:

- AQR.2H Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- AQR.3A Collect numerical bivariate data to create a scatterplot, select a function to model the data, justify the model selection, and use the model to interpret results and make predictions.
- AQR.3B Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.
Cycle 4
29 Days
Feb. 1 - Mar. 12, 2021

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<td><strong>Mathematical Process Standards.</strong> The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</td>
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<td><strong>AQR.1D</strong> Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</td>
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<td></td>
<td><strong>AQR.1G</strong> Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</td>
</tr>
<tr>
<td>Unit 16: Recursion in Exponential Growth and Decay</td>
<td>3 class periods (90-min. each) or 6 class periods (45-min. each)</td>
<td><strong>Numeric Reasoning.</strong> The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:</td>
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<td><strong>AQR.2H</strong> Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.</td>
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<td><strong>Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).</strong> The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:</td>
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<td><strong>AQR.3B</strong> Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.</td>
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<td></td>
<td><strong>AQR.3C</strong> Determine and analyze an appropriate growth or decay model for problem situations, including linear, exponential, and logistic functions.</td>
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<td>Unit</td>
<td># Class Periods</td>
<td>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</td>
</tr>
<tr>
<td>Unit 17: Recursion Using Rate of Change</td>
<td>4 class periods (90-min. each) or 8 class periods (45-min. each)</td>
<td>The bold face words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will:</td>
</tr>
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</table>

**Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- **AQR.3B** Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.
- **AQR.3C** Determine and analyze an appropriate growth or decay model for problem situations, including linear, exponential, and logistic functions.
### Cycle 5
28 Days
Mar. 22 - Apr. 30, 2021

<table>
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<th>Unit</th>
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</thead>
<tbody>
<tr>
<td><strong>Unit 17: Recursion Using Rate of Change</strong>&lt;br&gt;Students study recursion relationships in data and various representations with rate of change.</td>
<td>4 class periods (90-min. each)&lt;br&gt;or&lt;br&gt;8 class periods (45-min. each)</td>
<td>The bold essential knowledge and skills/student expectations (TEKS/SEs) indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course. The student will: <strong>Mathematical Process Standards.</strong> The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:&lt;br&gt;❖ AQR.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. &lt;br&gt;❖ AQR.1F Analyze mathematical relationships to connect and communicate mathematical ideas. <strong>Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).</strong> The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:&lt;br&gt;AQR.3B Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.&lt;br&gt;AQR.3C Determine and analyze an appropriate growth or decay model for problem situations, including linear, exponential, and logistic functions.</td>
</tr>
<tr>
<td><strong>Unit 18: Recursion in Cyclical Modeling</strong>&lt;br&gt;Students study recursion relationships in data and various representations from cyclical models.</td>
<td>2 class periods (90-min. each)&lt;br&gt;or&lt;br&gt;4 class periods (45-min. each)</td>
<td><strong>Mathematical Process Standards.</strong> The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:&lt;br&gt;❖ AQR.1A Apply mathematics to problems arising in everyday life, society, and the workplace. &lt;br&gt;❖ AQR.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems. <strong>Numeric Reasoning.</strong> The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:&lt;br&gt;AQR.2D Solve geometric problems involving indirect measurement, including similar triangles, the Pythagorean Theorem, law of sines, law of cosines, and the use of dynamic geometry software. <strong>Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).</strong> The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make</td>
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**Cycle 5**

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<tr>
<th>Unit</th>
<th># Class Periods</th>
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<tbody>
<tr>
<td><strong>Unit 19: Functions in Models: Regression in Linear and Nonlinear Functions</strong></td>
<td>3 class periods (90-min. each) or 6 class periods (45-min. each)</td>
</tr>
</tbody>
</table>

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

**Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)**

The **bold face** words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course.

**The student will:**

- informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:
  - **AQR.3B** Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.
  - **AQR.3D** Determine or analyze an appropriate growth or decay model for problem situations that can be modeled with periodic functions.

**Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- **AQR.3A** Collect numerical bivariate data to create a scatterplot, select a function to model the data, justify the model selection, and use the model to interpret results and make predictions.
- **AQR.3B** Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.
- **AQR.3C** Determine and analyze an appropriate growth or decay model for problem situations, including linear, exponential, and logistic functions.
### Cycle 5
28 Days  
Mar. 22 - Apr. 30, 2021  
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</table>
| **Unit 20: Functions in Models: Cyclical Functions**  
Students study regression relationships in cyclical functions. | 3 class periods (90-min. each)  
or 6 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
- **AQR.1G** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.  

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:  
- **AQR.3B** Describe the degree to which uncorrelated variables may or may not be related and analyze situations where correlated variables do or do not indicate a cause-and-effect relationship.  
- **AQR.3D** Determine or analyze an appropriate growth or decay model for problem situations that can be modeled with periodic functions.  

| Unit 21: Step and Piecewise Functions  
Students study regression relationships in linear, nonlinear, and cyclical functions. | 4 class periods (90-min. each)  
or 8 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- **AQR.1C** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
- **AQR.1F** Analyze mathematical relationships to connect and communicate mathematical ideas.  

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
- **AQR.2H** Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and...
### Cycle 5
**28 Days**
Mar. 22 - Apr. 30, 2021

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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The **bold face** words in the TEKS SEs indicate concepts addressed specially in this unit, the unbolded concepts are addressed in other units of this course.

**The student will:**

- minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.

**Algebraic Reasoning (Expressions, Equations, and Generalized Relationships).** The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:

- **AQR.3E** Determine or analyze an appropriate piecewise model for problem situations.

**Probabilistic and Statistical Reasoning.** The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:

- **AQR.4T** Communicate statistical results in oral and written formats using appropriate statistical and nontechnical language.
## Cycle 6

**29 Days**  
May 3 - June 11, 2021

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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| **Unit 21: Step and Piecewise Functions**  
Students study regression relationships in linear, nonlinear, and cyclical functions. | **4 class periods**  
(90-min. each)  
or  
**8 class periods**  
(45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- AQR.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.  
- AQR.1F Analyze mathematical relationships to connect and communicate mathematical ideas. |

### Numeric Reasoning

The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
- AQR.2H Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.

### Algebraic Reasoning (Expressions, Equations, and Generalized Relationships)

The student applies the process standards in mathematics to create and analyze mathematical models of everyday situations to make informed decisions related to earning, investing, spending, and borrowing money by appropriate, proficient, and efficient use of tools, including technology. The student uses mathematical relationships to make connections and predictions. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic real-world problems. The student is expected to:  
- AQR.3E Determine or analyze an appropriate piecewise model for problem situations.

### Probabilistic and Statistical Reasoning

The student uses the process standards in mathematics to generate new understandings of probability and statistics. The student analyzes statistical information and evaluates risk and return to connect mathematical ideas and make informed decisions. The student applies a problem-solving model and statistical methods to design and conduct a study that addresses one or more particular question(s). The student uses multiple representations to communicate effectively the results of student-generated statistical studies and the critical analysis of published statistical studies. The student is expected to:
## Cycle 6
### 29 Days
May 3 - June 11, 2021

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### Unit 22: Networks, Circuit, Paths, and Graph Structures
**Students develop networks and graphs to solve real-world situations.**

- **2 class periods** (90-min. each) or **4 class periods** (45-min. each)

**Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1D** Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- **AQR.1G** Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:

- **AQR.2H** Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.

### Unit 23: Spanning Trees
**Students develop graphs and spanning trees to solve real-world situations.**

- **2 class periods** (90-min. each) or **4 class periods** (45-min. each)

**Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- **AQR.1D** Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- **AQR.1G** Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:

- **AQR.2H** Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.
## Cycle 6

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<td>rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.</td>
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</tbody>
</table>

### Unit 24: Graph Coloring

Students create maps conforming to coloring properties.

<table>
<thead>
<tr>
<th></th>
<th>2 class periods (90-min. each)</th>
<th>4 class periods (45-min. each)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</td>
<td></td>
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<td></td>
<td>☑️ AQR.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</td>
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<tr>
<td></td>
<td>☑️ AQR.1G Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</td>
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<td></td>
<td>Numeric Reasoning. The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:</td>
<td></td>
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<tr>
<td></td>
<td>☑️ AQR.2H Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language.</td>
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</tr>
</tbody>
</table>
### Cycle 6
**29 Days**
May 3 - June 11, 2021

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

<table>
<thead>
<tr>
<th>Unit</th>
<th># Class Periods</th>
<th>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</th>
</tr>
</thead>
</table>
| Unit 25: PERT Charts | 2 class periods (90-min. each) or 4 class periods (45-min. each) | **Mathematical Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  
- AQR.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.  
- AQR.1G Display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.  

**Numeric Reasoning.** The student applies the process standards in mathematics to generate new understandings by extending existing knowledge. The student generates new mathematical understandings through problems involving numerical data that arise in everyday life, society, and the workplace. The student extends existing knowledge and skills to analyze real-world situations. The student is expected to:  
AQR.2H Select and apply an algorithm of interest to solve real-life problems such as problems using recursion or iteration involving population growth or decline, fractals, and compound interest; the validity in recorded and transmitted data using checksums and hashing; sports rankings, weighted class rankings, and search engine rankings; and problems involving scheduling or routing situations using vertex-edge graphs, critical paths, Euler paths, and minimal spanning trees, and communicate to peers the application of the algorithm in precise mathematical and nontechnical language. |