

# Introduction

## About these Materials

This set of curriculum guidance documents is designed to inform the use of the [Algebra 1, Geometry, Algebra 2 Illustrative Mathematics Curriculum](#) in the implementation of the High School Badging System developed for XQ Institute by Student Achievement Partners.

This curriculum was selected because of its strong alignment to the vision of the Common Core Math Standards, as evidenced by [EdReports'](#) review, and because it is licensed under the [Creative Commons Attribution 4.0 license](#), making it freely available at [Kendall-Hunt Publishing Company](#).

## About Our Process

These materials were developed by a team of educators using Illustrative Mathematics and/or the High School Badging System. Our team worked collaboratively to identify units and lessons aligned to the Badging System's Content and Practice Expectations by badge number.

Grounded in the Badging System's Framework Principles, our team also worked to leverage the structure and content of the curriculum to optimize opportunities for students to engage in the Badging System's Learning Principles.

Each document identifies the corresponding Illustrative Mathematics' course and unit materials and is comprised of three parts:

- Notes for improving overall alignment
- Unit Overview
- Guidance for Lesson Priority

What follows is a description of each component in order to provide educator teams with a way to make sense of and engage with these materials.

## Notes for improving overall alignment

This section consists of broad recommendations that apply across the board. Readers will see two types of recommendations: (1) ways to better attend to the Badging Learning Principles and (2) ways to better attend to Content and Practice Expectations in cases where we saw limited opportunities built into the curricular materials.

Sample

### M152: Reasoning and Proof through Congruence

#### Illustrative Mathematics–Geometry Unit 2-Congruence

##### Notes for improving overall alignment:

- Opportunities for students to engage in pair or group work are an integral part of this curricular design, and special considerations will need to be taken into account if working outside of a traditional classroom setting to give students opportunities to **engage in social activities (LP2)**.
- Leverage the structure of the curriculum to give space for students to **have agency in their learning (LP4)**. This can be accomplished by learning about students' interests and lived experiences, then tailoring curricular prompts to reflect those experiences and interests. Use the curriculum's mathematical learning arcs to structure opportunities and check for progress toward attainment of *Content and Practice Expectations*.
- Leverage the structure of the curriculum and opportunities to use the embedded math language routines to give students space to **view mathematics as a human endeavor across centuries (LP5)**. This can be done by positioning students as authors of important mathematical ideas, where their thinking is at the center of discussion and exploration, as well as by giving time to reflect on progress and personal growth.
- Educators will need to bring in space to attend to Indicator 152.a.i. Consider using Geometry Unit 1 Lessons 10, 13-14 to offer students space to use these skills. Spaces where we see an opportunity for this are indicated by a square ■.
- Educators will need to bring in space to attend to Indicator 152.j.i and 152.j.ii. Consider using Geometry Unit 1 Lesson 5 to offer students space to use these skills. Spaces where we see an opportunity for this are indicated by a triangle ▲.

## Unit Overview

This section consists of a table that illustrates when students have an opportunity to engage with each Content and Practice Expectation at the indicator level. It gives educators a birds-eye view of the story of the unit. It is important to note that lessons early in the unit may be at the introductory level and mastery is not expected. For CPEs with a short storyline, we encourage educators to utilize the embedded practice problems offered by the curriculum to give students additional opportunities as needed. Applicable practice problems will need to be identified at the local level.

Sample												
<b>Unit Overview</b>												
	<u>L1</u>	<u>L2</u>	<u>L3</u>	<u>L4</u>	<u>L5</u>	<u>L6</u>	<u>L7</u>	<u>L8</u>	<u>L9</u>	<u>L10</u>	<u>L11</u>	<u>MT</u>
155.a.i	X	X	X	X	X							X
155.a.ii				X	X							
155.b.i								X				
155.b.ii								X		X		
155.c.i					X	X	X		X	X	X	X
155.c.ii									X	X		X

## Guidance for Lesson Priority

This section consists of a table that lists each lesson and offers more details to inform lesson design. We recognize that local needs may differ and additional factors may need to be taken into account as educators make instructional and curricular decisions. Recommendations found in this table are to be considered as a starting point for a team's consideration.

Educators will find the following information provided:

- **Unit and lesson:** 5.7 refers to Unit 5 Lesson 7. On occasions when units from multiple courses are brought together to meet the expectations of a particular badge, the appropriate course will be communicated.
- **Priority:** A letter of D, M, or K is used to communicate our recommendation. Insights into these codes and our rationale is as follows:
  - K= Keep. We saw strong alignment to the CPEs and Learning Principles. Minimal, if any, modifications need to be done.
  - M= Modify. We saw an opportunity to make space for additional CPEs and/or stronger alignment to our Learning Principles with some modification. Recommendations are offered for your consideration.
  - D= Delete. We saw limited to no connection to the badge's CPEs. In these cases we
- **Content and Practice Expectations (CPE):** A list of the CPEs seen in the lesson. Information is provided at the indicator level.
- **Learning Principles (LP):** A list of the Learning Principles available in the lesson.
- **Additional Lesson Information:** Gives description of the **context** and **math focus** of the lesson.

Sample				
Guidance for Lesson Priority				
Unit.Lesson	Priority D - Delete M - Modify K - Keep	Content and Practice Expectations (CPE)	Learning Principles (LP)	Additional Lesson Information
5.1	D Not needed to enter Lesson 5.2. Genie context extension not aligned with LPs.			<b>Context:</b> Bacteria growth, genie wishes <b>Math focus:</b> Linear and non-linear growth basics, review of grades 6,7,8
5.2	M Prioritize Activity 5.2.3 to give students an opportunity to see math as relevant (LP6), especially if students express an interest in use of social media. Doing so may mean skipping Activity 5.2.2.	104.b.i 104.b.ii 104.e.i 104.e.ii	LP3, LP6	<b>Context:</b> Social media <b>Math Focus:</b> Understanding the difference between exponential and linear
5.3	K	104.bi 104.b.ii 104.c.i 104.c.ii 104.e.ii 104.f.i	LP3	<b>Context:</b> Bacteria growth <b>Math Focus:</b> Multiple ways to represent exponential relationships

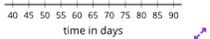
## Glossary of Terms Used

Terminology our team worked to define that you'll see surface across these documents are as follows:

- **Leverage structure of curriculum**

- IM is designed to have learning arcs which start with an invitation to the mathematics by way of a warm-up, followed by a deep study of concepts by way of two-three instructional activities, culminating in time to consolidate and synthesize learning by way of a lesson synthesis and cool-down. You can learn more about the curriculum’s [design principles at Kendall-Hunt’s website](#).
- IM offers embedded instructional routines and deliberate instructional design to ensure all students have multiple means of engagement, representation, and action and expression in alignment with the principles of [Universal Design for Learning](#). We urge educators to utilize these routines and structures in service of their students. This will not only ensure access to the content for all students, but will also offer ways to attend to the Badging System’s Learning Principles. You can learn more about access for [multilingual learners](#) and [students with disabilities](#) at Kendall-Hunt's website.
- **Amplify**
  - Used to invite educators to consider centering the suggested activity to optimize connections to identified Content and Practice Expectations (CPE) and/or Learning Principles. In these cases, another instructional activity within the lesson will need to be de-emphasized or skipped. In making these recommendations, we worked to honor the coherence built into the curriculum.
    - In cases where an activity is amplified in order to better attend to the Learning Principles, we envision multiple possibilities: (1) giving students more time to truly engage and connect with the context and/or (2) using the mathematical focus and suggested instructional strategies, but paired with a local context students can relate to. An example of each is illustrated in the table below. For additional ideas on structuring experiences that attend to the Learning Principles, see the Annotated Examples provided in each badging framework.

Engaging students more deeply into the context
<a href="#">A1 Unit 1 Lesson 2 Activity 2: Tomato Plants: Histogram</a>

<p><b>2.3: Tomato Plants: Box Plot</b></p> <p>A box plot can also be used to represent the distribution of numerical data.</p> <table border="1" data-bbox="640 289 898 337"> <tr> <td>minimum</td> <td>Q1</td> <td>median</td> <td>Q3</td> <td>maximum</td> </tr> </table> <ol style="list-style-type: none"> <li>Using the same data as the previous activity for tomato plants, find the median and add it to the table. What does the median represent for these data?</li> <li>Find the median of the least 15 values to split the data into the first and second quarters. This value is called the first quartile. Add this value to the table under Q1. What does this value mean in this situation?</li> <li>Find the value (the third quartile) that splits the data into the third and fourth quarters and add it to the table under Q3. Add the minimum and maximum values to the table.</li> <li>Use the <b>five-number summary</b> to create a box plot that represents the number of days it takes for these tomato plants to produce tomatoes.</li> </ol> 	minimum	Q1	median	Q3	maximum	<p>Our Recommendation: Consider asking students to consider why anyone would want to know the number of days it takes for a tomato plant to start producing fruit as a launch to the activities in this lesson to attend LP6.</p>
minimum	Q1	median	Q3	maximum		
<p>Engaging students by selecting a local context</p>						
<p><u>A2 Unit 6 Modeling Task- Swept Away</u></p>						
<p><b>Swept Away</b></p> <p>You will construct a model for the tides in Boston for July 4 and July 5, 2018 and then use your model to make predictions about future tides. Here are the water levels during this two day period. The water level is given relative to the mean lower low water.</p>	<p>Our Recommendation: Consider using local data to increase degree of relevance.</p>					

- In cases where an activity is amplified in order to better attend to the identified CPEs, we recognized a way to give entry into the mathematics by adding or modifying synthesizing questions offered within the curriculum teacher narrative.

## Additional Resources for Illustrative Mathematics Curriculum

- Learn more about the IM Mathematical Modeling Prompts:  
[https://im.kendallhunt.com/HS/teachers/mathematical\\_modeling\\_prompts.html](https://im.kendallhunt.com/HS/teachers/mathematical_modeling_prompts.html)
- Access additional curricular resources at IM Resource Hub for more ideas:  
<https://hub.illustrativemathematics.org/s/912>