



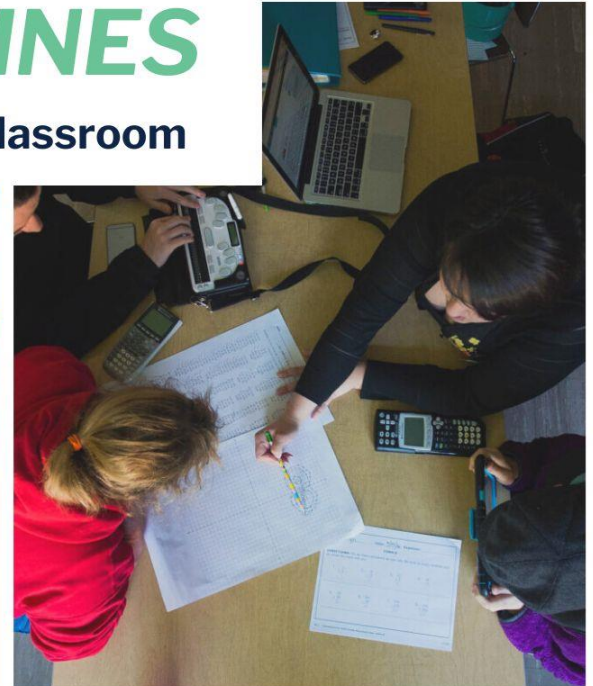
Kentucky Department of  
**EDUCATION**

# Text-Based Writing *ACROSS DISCIPLINES*

An Expansion of Composition in the Classroom



**FALL 2023**



# What is Text-Based Writing Across Disciplines?

## What does “Text-Based Writing Across Disciplines” mean?

Defining “Text-Based Writing Across Disciplines” requires clarity around the terms “Text-Based,” “Writing” and “Across Disciplines.” “Text-Based” signals that students are engaged with complex, grade level texts throughout their learning. Most simply, writing is communicating. Student writers communicate with themselves, peers, teachers and others. Writing in the classroom can have many purposes and audiences and may be formal or informal. In the academic setting, writing can serve as a tool to promote student learning, to allow students to demonstrate their thinking and understanding of the content and/or concepts taught, and/or to share with others in a real-world setting. These types of writing are called Writing to Learn, Writing to Demonstrate Learning and Writing for Publication. “Across Disciplines” refers to using the types of writing—as defined here—in English/language arts as well as other disciplines, such as social studies, science, math and visual and performing arts.

***Each of the tasks in this resource ground students in complex, grade-level text throughout the writing process.***

## What is Reading and Writing Across Disciplines, and what is its purpose?

*Reading and Writing Across Disciplines* is an expansion of [Composition in the Classroom](#), a resource developed by reading and writing teachers to help Kentucky educators provide students with opportunities to develop into confident, independent and proficient writers. *Composition in the Classroom* and its expansions support teachers implementing existing [High-Quality Instructional Resources](#) (HQIRs) adopted by school districts as well as educators teaching in districts that have not yet adopted a primary HQIR in reading and writing. The tips, suggestions and tasks in *Composition in the Classroom* and its expansions should not replace adopted HQIRs but rather should serve to supplement instruction towards the full depth and rigor of the *Kentucky Academic Standards*. For more information regarding high-quality literacy curricula, districts and school leaders may access [The Reading and Writing Instructional Resources Consumer Guide](#), a tool for evaluating and selecting instructional resources for alignment to the *Kentucky Academic Standards (KAS) for Reading and Writing*.

*Composition in the Classroom* is organized around three modes of writing in the *Kentucky Academic Standards (KAS) for Reading and Writing*, including information regarding standards-aligned instruction through Writing to Learn, Writing to Demonstrate Learning and Writing for Publication. *Reading and Writing Across Disciplines*, however, contains sample discipline-specific reading and writing tasks, organized by each of the three types of writing mentioned above. This resource is grounded in the *KAS for Reading and Writing*, which includes the Interdisciplinary Literacy Practices as well as each discipline’s content specific standards. The ten Interdisciplinary Literacy Practices are part of the *KAS for Reading and Writing*, appearing on every page of the standards document but should not be confused as additional standards. They should guide teachers in providing intentional opportunities for students to engage in deeper learning by practicing the behaviors of a literate citizen. The student practices serve as the overarching goals for literacy instruction for each student across the state. These practices are further clarified by [possible teacher and student actions](#). These actions do not define curriculum, but rather they demonstrate how teachers can provide opportunities for students to experience the literacy practices and how students will apply these practices, so they may become an innate part of life across the disciplines and beyond school. This resource aims to bring more clarity around what these practices look like in action.

While *Composition in the Classroom* primarily serves English/language arts teachers and their students, *Reading and Writing Across Disciplines* attends to the needs of all teachers and their students. Because of its widespread classroom use already, the developers chose to begin the expansion with a focus on Writing to Learn (October 2023), a professional learning space that will hopefully both affirm and stretch educators' practices. The second release added Writing to Demonstrate Learning (March 2023) and the final release will include Writing for Publication (September 2023).

*Reading and Writing Across Disciplines* provides what *Composition in the Classroom*, alone, does not. While *Composition in the Classroom* provides general characteristics of each type of writing (Writing to Learn, Writing to Demonstrate Learning and Writing for Publication) and examples of strategies teachers can implement to engage students in each of the types of writing, this expansion includes a more disciplinary, or specialized, look at writing. *Reading and Writing Across Disciplines* intends to show more precisely how to ensure opportunities for students to engage in discipline-specific literacies or learning that uses reading and writing skills specific to each field to teach or demonstrate content knowledge and for publication purposes as well. The sample tasks in *Reading and Writing Across Disciplines* represent some of the types of reading and writing experts in each field (e.g., economists, biologists, literary scholars, mathematicians, etc.) might authentically engage in to deepen their own expertise.

## Reading and Writing FOR PUBLICATION Across Disciplines

[Writing for Publication](#), as previously described, allows students to share their learning with audiences beyond the classroom and school community. Writing for Publication is preceded by intentional opportunities for students to Write to Learn and Write to Demonstrate Learning. The primary difference between Writing to Demonstrate Learning and Writing for Publication is the *audience*: whereas teachers are the primary audience of Writing to Demonstrate Learning, publication is for the world beyond the school community.

“Publication” indicates writing will be shared with an intended audience and approximates writing done in a variety of real-world settings, such as in a career or academic setting or in response to civic duty. Pieces for publication are produced for an authentic audience and purpose and are also directly relevant to students’ learning. Ideally, students make decisions about audience, purpose and/or form based on their interests, experiences or inquiry. These pieces of writing are more successful when the writers pay careful attention to success criteria for writing. Teacher and/or student created rubrics may address audience/purpose, idea development, organization, word choice and conventions as well as the content of the subject matter.

Authentic Writing for Publication is writing for authentic audiences and purposes that has been taken through the complete writing process. Draper & Siegert (2010) define Writing for Publication as tasks that allow students “to negotiate (e.g., read, view, listen, taste, smell, critique) and create (e.g., write, produce, sing, act, speak) texts in discipline-appropriate ways or in ways that other members of a discipline (e.g., mathematicians, historians, artists) would recognize as ‘correct’ or ‘viable.’”<sup>1</sup> Thus, Writing for Publication must include both reading complex disciplinary text and then writing about what is learned as a disciplinary expert might write.

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<sup>1</sup> Draper, R.J., & Siebert, D. (2010). Rethinking texts, literacies, and literacy across the curriculum. In R.J. Draper, P. Broomhead, A.P. Jensen, J.D. Nokes, & D. Siebert (Eds.), *(Re)imagining content-area literacy instruction* (pp. 20–39). New York: Teachers College Press.



When students Write for Publication, they become subject matter experts who communicate their learning to the world, requiring them to make considerations for the needs of their audience. In addition to the content and skills of the discipline, many students may also require instruction or support in using technological tools, communication platforms or technical writing/communication strategies used in professional or career settings. Consider opportunities to collaborate with professionals outside of the field of education to provide feedback or serve as the authentic audience to prepare students to Write for Publication. For example, the grade 4 visual art sample task included in this resource asks students to write biographies of fellow student artists prior to presenting the art in a community show. Teachers may collaborate with local gallerists or artists to discuss why this type of writing matters in the field of visual art. In the high school physics sample task, students write a proposal to improve local energy infrastructure. Teachers may collaborate with local energy experts or engineers to share knowledge about their field as well as provide feedback on student proposals.

At the heart of Writing for Publication is **Interdisciplinary Literacy Practice 10: Develop a literacy identity that promotes lifelong learning.** Indeed, as students access complex texts across disciplines and apply their learning from those texts to real world problems, educators can create an environment where students are empowered as lifelong learners able to think for themselves and effectively propose solutions to complex problems. When students have opportunities to engage with relevant issues through the texts they read and write, they can engage more deeply in inquiry and ultimately can take stronger ownership of their learning.

## How to Read the Templates

Each content area template begins broadly with a compilation of possible Writing to Learn, Writing to Demonstrate Learning and Writing for Publication strategies that experts in the field deem especially applicable to learning that discipline's content. The remainder of each template provides authentic content-specific sample tasks, organized into elementary and secondary levels. These sample tasks can help educators recognize the presence or absence of Writing to Learn, Writing to Demonstrate Learning or Writing for Publication instructional strategies within their adopted high-quality instructional resource (HQIR), equipping them with the knowledge to identify when the curriculum does not include adequate opportunities for students to engage in both types of writing. Because the types of texts involved in reading and writing vary across disciplines, each sample contains discipline-specific approaches each type of writing.

## Writing for Publication in Mathematics Instruction

### Implementing Writing for Publication in Mathematics Instruction

Writing for Publication in the mathematics classroom should be a regular occurrence. This type of writing provides opportunities for students to engage an authentic audience with their stories, ideas or research beyond the classroom.

Writing for Publication can engage students in learning mathematics in a way that allows them to develop voice and perspective to participate in an authentic context beyond the classroom more fully. Ideally, students make decisions about audience, purpose and/or form based on their interests, experiences or inquiry. This type of writing is grounded in authentic context, promoting the use of primary source documents or lessons, such as graphs, situations, etc. that deal with current world events. For example, students might be asked to apply proportional reasoning to plan a school event or analyze a problem in the community (MP.4).

Writing for Publication offers an opportunity to bring in students' funds of knowledge by ensuring mathematics tasks have a connection with learners while also providing opportunities to learn about the broader world. Well-developed ideas reflect the student's thinking, understanding of mathematics, and the ability to explain to help readers and to accomplish the purpose. Students develop ideas with depth and complexity to provide insight, support, and clarification of the topic through the use of appropriate and effective examples, details, facts, explanations, descriptions or arguments.

**The Modeling Cycle and Writing for Publication:** The *KAS for Mathematics* declare [Mathematical Modeling](#) is a process made up of the following components:

- **Identify the problem:** Students identify something in the real world they want to know, do or understand. The result is a question in the real world.
- **Make assumptions and identify variables:** Students select information important in the question and identify relations between them. They decide what information and relationships are relevant, resulting in an idealized version of the original question.
- **Do the math:** Students translate the idealized version into mathematical terms and obtain a mathematical formulation of the idealized question. This formulation is the model. They do the math to derive insights and results.
- **Implement the model:** Students report results to others and implement the solution as part of real-world, practical applications.
- **Iterate:** Students iterate the process as needed to refine and extend a model.
- **Analyze and assess the solution:** Students consider the following questions: Does it address the problem? Does it make sense when applied in the real world? Are the results practical? Are the answers reasonable? Are the consequences acceptable?

## Implementing Writing for Publication in Mathematics Instruction

Products that result from engaging in the modeling process, such as data visualizations, diagrams, blueprints, computer programs, etc. might be examples of Writing to Publish if those artifacts are shared with an authentic audience beyond the classroom. Some additional examples of Writing for Publication in the mathematics classroom could include, but are not limited to:

- **News articles, Op-eds, Infographics, Brochures, Videos, Social Media Posts, Letters/Emails to community leaders** can offer students opportunities to make a reasoned judgment after analyzing information, data, facts. These artifacts, along with an authentic audience can encourage students to consider how making responsible decisions can promote systemic change within their local context and beyond.
- **Mathematical Argument/Critique of a Mathematical Argument** can offer students opportunities to justify their conclusions, communicate them to others and respond to the arguments of others.

Writing for Publication typically develops over time and results from students engaging in a variety of intentional, deeper learning experiences such as Writing to Learn tasks like those described in [Writing to Learn in Mathematics](#). See [Writing to Demonstrate Learning in Mathematics](#) for tools for assessing and monitoring progress towards mastery of skills and concepts.

## About the Writing for Publication in Mathematics Tasks in this Resource

The Writing for Publication sample tasks engage students in understanding and applying the statistical process across Measurement and Data in Grade 5 and Statistics and Probability in Grade 6 and in high school. Each sample shows how Writing for Publication can be a natural result of engaging in the four-step investigative process for statistical reasoning:

- a. Formulate Questions:** Formulate a statistical question as one that anticipates variability and can be answered with data.
- b. Collect Data:** Design and use a plan to collect appropriate data to answer a statistical question.
- c. Analyze Data:** Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.
- d. Interpret Results:** Draw logical conclusions and make generalizations from the data based on the original question.

Elementary students begin exploring the statistical process in Grade 1 ([KY.1.MD.4](#)), with the investigations increasing in depth and complexity moving forward.

Writing for Publication must demonstrate an awareness of the needs of an authentic audience. Mathematicians demonstrate audience awareness by:

- providing specific details;
- conveying ideas of relevance;
- providing background information;
- revealing critical thinking;
- employing an appropriate tone; and
- organizing ideas.

As such, attention will need to be given to supporting students in telling the story of the data they investigated to their specific audience. One way to encourage audience awareness might be to have students create a [slow reveal graph](#). The process of deconstructing their data visualization would encourage students to consider which specific details to highlight, how ideas are organized and how the information is relevant to themselves and to the audience.

In both sample tasks, the instructional emphasis remains on the content and practice standards within the *KAS for Mathematics*. The *KAS for Mathematics* differs from previous standards in that they intentionally integrate content and practices in such a way that every Kentucky student will benefit mathematically. Put simply, the Standards for Mathematical Content define what students should understand and be able to do. Standards for Mathematical Practice define how students engage in mathematical thinking.



## Grade 5 Writing for Publication Sample for Mathematics

Mathematics Content Standards Alignment	Standards for Mathematical Practice Alignment	Reading and Writing Standards Alignment	Interdisciplinary Literacy Practices Connections
<p><b>Cluster:</b> Understand and apply the statistics process.</p> <p><b>KY.5.MD.2</b> Identify and gather data for statistical questions focused on both categorical and numerical data. Select an appropriate data display (bar graph, pictograph, dot plot). Make observations from the graph about the questions posed.</p> <p><b>Target of the Standard:</b> Application</p>	<p><b>MP.4 Model with Mathematics.</b> The four-step investigative process provides a structure for students to follow that allows them to model many real-world situations with a model.</p> <p><b>MP.5 Use appropriate tools strategically.</b> Students informally determine whether a selected model is appropriate for a set of data and use technology when appropriate to do so.</p> <p><b>MP.6 Attend to precision.</b> Students choose precisely which graph best represents the data in order to make sense of the real-world problem.</p>	<p><b>RI.5.9</b> Integrate information from several texts on the same theme or topic.</p> <p><i>In this task, students are interpreting and integrating data collected from various sources into a graph.</i></p> <p><b>C.5.2</b> Compose informative and/or explanatory texts, using writing and digital resources, to examine a topic and convey ideas and information clearly.</p>	<p><b>ILP 1:</b> Recognize that text is anything that communicates a message.</p> <p><b>ILP 4:</b> Utilize receptive and expressive language arts to better understand self, others and the world.</p> <p><b>ILP 8:</b> Engage in specialized, discipline-specific literacy practices.</p>

## Grade 5 Mathematics Task

Task Adapted from EngageNY: [Types of Data](#)

Now that we have learned about statistical questions, consider how data can help you take action to make changes in our school or community. Statistics is about using data to answer questions.

Think about a statistical question that you could answer for our school leadership that would provide helpful information to make our school a better place.

You will pose and answer a question based on data using the four-step process below.

### **Prepare to Write for Publication:**

**Step 1:** Pose a question that can be answered by data.

*Consider these examples from our learning about statistical questions:*

- *What is the favorite subject of fifth graders at my school?*
- *How many hours do students typically play video games in my school?*
- *What is the typical distance (in miles) from school to home for students in my school?*

*What question might you pose and answer to help make our school a better place?*

**Step 2:** Determine a plan to collect the data.

*For this project, we will be collecting data from our class to share with our school leadership.*

**Step 3:** Summarize the data with graphs and numerical summaries.

*Think about what information your audience will need and how you might display the information for them to understand clearly.*

### **Write for Publication:**

**Step 4:** Answer the question posed in Step 1 using the data and summaries.

*Publish your findings by sharing your data with the school leadership.*

## Grade 5 Mathematics Teacher Notes

Students begin a study of statistics by learning to recognize a statistical question such as:

- What is the favorite subject of fifth graders at my school?
- How many hours do students typically play video games in my school?
- What is the typical distance (in miles) from school to home for students in my school?

They develop an understanding of what data could be collected to answer a statistical question. Students engage in a four-step process for posing and answering questions based on data.

As students begin to explore data, they see the need to organize and summarize the data. Students see the idea that a data distribution can be represented graphically and there are several types of graphs, including dot plots and histograms, commonly used to represent a distribution of numerical data. Use the prompt below with students.

As Writing for Publication is grounded in student ownership, building on student and community interests and expertise is paramount. As students explore a question of interest to them, the authentic audience may vary as well. Consider finding authentic audiences who meet the following criteria: an individual or group who values student voice and who partner in taking action with students. For example, a student may want to investigate their school/community on how to make their playground ADA compliant and present the information to the local school board on why the playground should meet the needs of their community. A student may want to advocate for an interest group/club within their school and collect data to present to the principal why this group should exist.

A statistical question is one that can be answered by collecting data and where there will be variability in the data. Two types of data are used to answer statistical questions: numerical and categorical. More information about statistical questions, including numerical and categorical data sets, is below.

What is a statistical question?

- A statistical question is one that can be answered by collecting data that vary. All of the data values are not the same.

What is the difference between a numerical data set and a categorical data set?

- Every value in a numerical data set is a number. The values in a categorical data set are not numerical. They are categories.

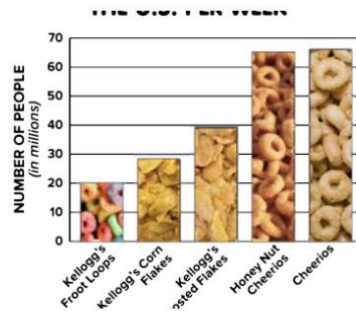
Some examples of data sets that students could use or get ideas from:

- Favorite types of playground equipment
- Heights of 20 fifth graders (numerical)
- Favorite flavor of ice cream for each of 10 fifth graders (categorical)
- Hours of sleep on a school night for each 30 fifth graders (numerical)
- Type of beverage drunk at lunch for each of 15 fifth graders (categorical)

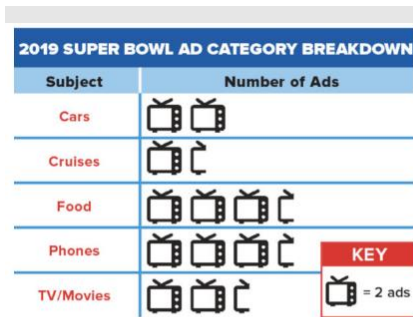
## Grade 5 Mathematics Teacher Notes

- Eye color for each of 30 fifth graders (categorical)
- Number of pencils in the desk of each of 15 fifth graders (numerical)

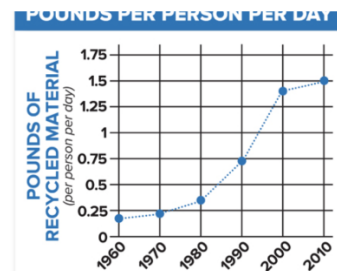
Ideally, students may choose a statistical question that resonates with them as they go through the 4-step process to showcase to an authentic audience, by engaging them with a [slow reveal graph](#) (some examples below). Note that slow reveal graphs provide a natural means for students to attune to the needs of an authentic audience processing data for the first time, teaching not only the statistics content but also the mindsets necessary for skilled writing and presentation of data.



Most Eaten Cereals in the US Per Week (2018)



2019 Super Bowl Ad Category Breakdown



Materials Recycled in Pounds per Person per Day (US)



The Number of Female CEOs Is Rising

## Grade 6 and High School Statistics Writing for Publication Sample

The statistical process, as mentioned in the Grade 5 sample above, is an ongoing investigation across grade levels within the KAS for Mathematics. In Grade 6 students are working with one-variable data, whereas in high school students are investigating the association between two-variables (including linear, exponential and quadratic relationships). Thus, both the Grade 6 and high school standards will be included within this discussion, with the understanding that the expectations of the task itself can be adjusted to suit either.

Grade 6 Content Standards Alignment	Standards for Mathematical Practice Alignment	Reading and Writing Standards and Interdisciplinary Literacy Practices Connections
<p><b>Cluster:</b> Develop understanding of the process of statistical reasoning.</p> <p><b>KY.6.SP.0</b> Apply the four-step investigative process for statistical reasoning.</p> <p>a. Formulate Questions: Formulate a statistical question as one that anticipates variability and can be answered with data. b. Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. c. Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group. d. Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question.</p> <p><b>Target of the Standard:</b> Application</p>	<p><b>MP.1 Make sense of problems and persevere in solving them.</b> Students use the statistical process to seek to understand the world around them, taking time to pursue the entire process in order to gain insights, looping back to make revisions to the question or data gathering if the results they have do not adequately address their question.</p> <p><b>MP.3 Construct viable arguments and critique the reasoning of others.</b> Students draw and discuss conclusions about a statistical question (MP.3) using appropriate mathematical models.</p> <p><b>MP.4 Model with Mathematics.</b> The four-step investigative process provides a structure for students to follow that allows them to model many real-world situations with a model.</p> <p><b>MP.5 Use appropriate tools strategically.</b> Students informally determine whether a selected model is appropriate for a set of data and use technology when appropriate to do so.</p> <p><b>MP.7 Look for and make use of structure.</b> Students discover structures or patterns in data to answer statistical questions using tables or appropriate representations.</p>	<p><b>Standards Alignment:</b></p> <p><b>RI.6.7</b> Integrate information presented in print and non-print formats to develop a coherent understanding of a topic or issue.</p> <p><b>C.6.2</b> Compose informative and/or explanatory texts to examine a topic and convey ideas, concepts and information through the selection, organization, and analysis of relevant content.</p> <p><b>Interdisciplinary Literacy Practices Connections:</b></p> <p><b>ILP 1:</b> Recognize that text is anything that communicates a message.</p> <p><b>ILP 4:</b> Utilize receptive and expressive language arts to better understand self, others and the world.</p> <p><b>ILP 8:</b> Engage in specialized, discipline-specific literacy practices.</p>



High School Content Standards Alignment	Standards for Mathematical Practice Alignment	Reading and Writing Standards and Interdisciplinary Literacy Practices Connections
<p><b>Cluster:</b> Summarize, represent and interpret data on two categorical and quantitative variables.</p> <p><b>KY.HS.SP.6</b> Represent data on two quantitative variables on a scatter plot and describe how the explanatory and response variables are related.</p> <p>a. Calculate an appropriate mathematical model, or use a given mathematical model, for data to solve problems in context.</p> <p>b. Informally assess the fit of a model (through calculating correlation for linear data, plotting, calculating and/or analyzing residuals).</p> <p><b>Target of the Standard:</b> Application</p>	<p><b>MP.1 Make sense of problems and persevere in solving them.</b> Students use the statistical process to seek to understand the world around them, taking time to pursue the entire process in order to gain insights, looping back to make revisions to the question or data gathering if the results they have do not adequately address their question.</p> <p><b>MP.3 Construct viable arguments and critique the reasoning of others.</b> Students draw and discuss conclusions about a statistical question (MP.3) using appropriate mathematical models.</p> <p><b>MP.4 Model with Mathematics.</b> The four-step investigative process provides a structure for students to follow that allows them to model many real-world situations with a model.</p> <p><b>MP.5 Use appropriate tools strategically.</b> Students informally determine whether a selected model is appropriate for a set of data and use technology when appropriate to do so.</p> <p><b>MP.7 Look for and make use of structure.</b> Students discover structures or patterns in data to answer statistical questions using tables or appropriate representations.</p>	<p><b>Standards Alignment:</b></p> <p><b>RI.11-12.7</b> Integrate and evaluate multiple sources of information presented in different print and non-print formats in order to address a question or solve a problem.</p> <p><b>C.11-12.2</b> Compose informative/ explanatory texts to examine and/or convey complex ideas, concepts and information clearly and accurately through the effective selection, organization and analysis of content.</p> <p><b>Interdisciplinary Literacy Practices Connections:</b></p> <p><b>ILP 1:</b> Recognize that text is anything that communicates a message.</p> <p><b>ILP 4:</b> Utilize receptive and expressive language arts to better understand self, others and the world.</p> <p><b>ILP 8:</b> Engage in specialized, discipline-specific literacy practices.</p>

## Grade 6 and High School Statistics Mathematics Task

As you engage in the four-step investigative process for statistical reasoning, you will:

### Prepare to Write for Publication

**Step 1:** Formulate a statistical question of interest to you that impacts you, your school or your community and can be answered with data. Determine a specific audience in our school or community that would benefit from the data you will provide. Include a purpose for how they might use the data.

Below are some sample questions you might consider accompanied by a potential audience and purpose. Note that these represent samples, and you should use the linked Topic Brainstorm to develop a different topic based on your interests.

- *How many minutes do students travel to get to school each day?*  
**Audience:** school transportation officials, administrators, community members, families, School Resource Officers (SROs), students  
**Purpose:** to provide and consider the implications of the data to take action about student transportation
- *What kinds of assignments do students typically do outside of class rather than in class?*  
**Audience:** Site-Based Decision Making (SBDM), teachers, principals, parents, students  
**Purpose:** to provide and consider the implications of the data to take action about student workload and supports
- *What might encourage more young voters?*  
**Audience:** local election officials, social studies classes, the community, local politicians and civic organizations  
**Purpose:** to provide and consider the implications of the data to take action about young voter engagement

Use the [Project Topic Brainstorm](#) to identify who might be a part of your life, perhaps from your school (a specific teacher, coach, staff member, principal, athletic director, custodian) or in your community (city commissioners, parks and recreation, business owner, homeowners association, non-profit director) and would be willing to partner with you to influence to take action on the question you are exploring.

**Step 2:** Design and use a plan to collect appropriate data to answer your statistical question.

## Grade 6 and High School Statistics Mathematics Task

**Step 3:** Select appropriate graphical methods and numerical measures to analyze your data.

*Note: In Grade 6 this might mean displaying variability within a group, comparing individual to individual and comparing individual to group. In high school this might mean describing how the explanatory and response variables are related when looking at bivariate data.*

### Write for Publication

**Step 4:** Draw logical conclusions and make generalizations from the data based on the original question.

Communicate the results of your four-step investigative process (letter, email, in-person or virtual meeting with presentation slides) to the individual or group in your school or community you identified as your audience to take action in response to the conclusions and generalization you have made based on the data

## Grade 6 and High School Statistics Mathematics Teacher Notes

Unlike the Grade 5 task above, this Grade 6/high school task requires students to determine their own audience and purpose based on their selected statistical question. Students may need support identifying an authentic audience and purpose. The linked Project Topic Brainstorm above supports students in posing and answering a statistical question that is both of interest and may provide data to support changes in their school or community. As students explore a question of interest to them, the authentic audience may vary as well. Work with school leadership to determine data that students might collect to address school or community needs.

### **Additional Examples to Consider:**

*How many pounds of materials from the school are recycled each week? ([Sample Slow Reveal Graph](#))*

**Audience:** *the school recycling club, local recycling authorities, administrators, parents*

**Purpose:** *to promote more recycling efforts or raise awareness about recycling at schools*

*How do students use cell phones during the school day? ([Sample Slow Reveal Graph](#))*

**Audience:** *students, parents, administrators, school mental health professionals*

**Purpose:** *to raise awareness about how students use cell phones in the community*

As Writing for Publication is grounded in student ownership, building on student and community interests and expertise is paramount. For support facilitating Writing for Publication at the end of a data science learning experience, consider accessing these slides from [Unit 8 of YouCubed's Data Science curriculum](#) on their process. This will be an iterative process mirroring how data scientists work on a project. Students will gather their own data. They will make decisions about how to work with it and describe the choices they have made including what technology tools to use, cleaning moves, visualization selection, univariate or bivariate data choices, combining data, and other content relevant to their project of choice.

### **Another consideration to support authentic Writing for Publication:**

Students bring important knowledge, interests, and experiences from their daily lives to the classroom that teachers should elicit and use to inform instruction. An instructional technique called [self-documentation](#) is one way to do this. Educators who anticipate students having difficulty selecting a question to explore might consider engaging students in self-documentation prior to beginning the task. STEM Teaching Tools [Practice Brief 31](#), *How to launch STEM investigations that build on student and community interests and expertise*, recommends the following instructional steps for self-documentation:

1. Ask students to “photo document” aspects of their everyday lives (e.g., about a phenomena or topic);
2. Cluster their photos into similar activities;
3. Identify which activities are possible areas of investigation for the unit;
4. Support students in engaging in investigations related to their focus; and
5. Arrange for students to present their results to members of the school or community who are invested in the issues addressed.

## Grade 6 and High School Statistics Mathematics Teacher Notes

### An Additional Note on the KAS for Mathematics:

In Grade 6, the emphasis is on understanding answering a statistical question and is completed by an investigative process that encompasses questioning, collection, analysis and interpretation of the data gathered.

In high school, emphasis is on linear, quadratic and exponential models as illustrated below.

