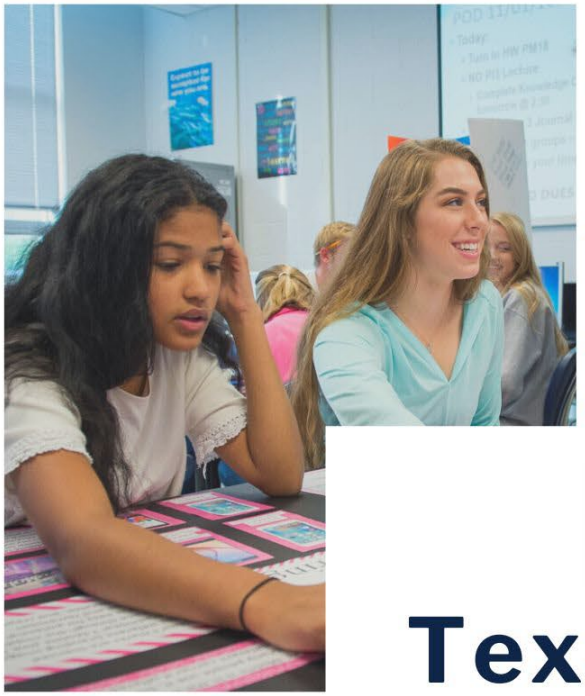


Kentucky Department of
EDUCATION

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).

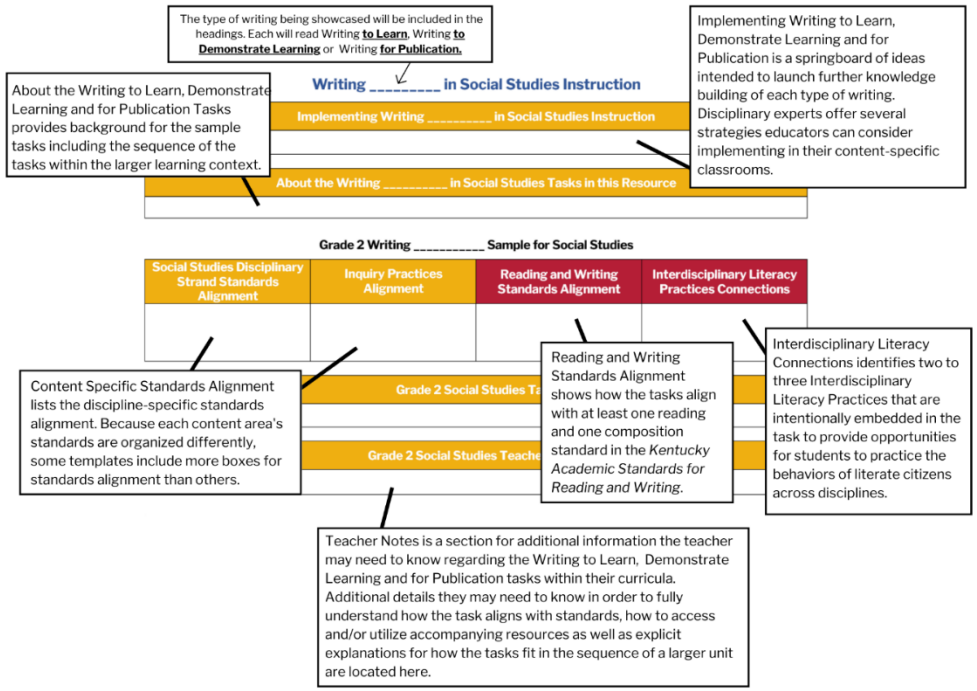
Reading and Writing Across Disciplines provides what *Composition in the Classroom*, alone, does not. While *Composition in the Classroom* provides general characteristics of each type of writing (Writing to Learn, Writing to Demonstrate Learning and Writing for Publication) and examples of strategies 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 TO LEARN Across Disciplines

Writing to Learn, as previously described, is an instructional strategy used to promote student learning. Teachers utilize this instructional strategy to help deepen students' understanding of the subjects they are studying, to engage students in thinking, to provide opportunities for applying, extending and developing skills, and to help students reflect on their learning. Typically, Writing to Learn is informal writing with the student as the primary audience. Rather than emphasizing formal composition skills, Writing to Learn helps students obtain content knowledge and build capacity to analyze, synthesize, comprehend and express their thinking in writing. Most simply stated, Writing to Learn is any writing students engage in that promotes learning. Therefore, Writing to Learn Across Disciplines refers to using Writing to Learn in English/language arts as well as other disciplines, such as math, science, social studies and visual and performing Arts. The first section of this expansion, Writing to Learn Across Disciplines, provides samples of Writing to Learn tasks for each discipline. Explicit reading-writing connections are intentionally present throughout the sample tasks, requiring students to read and think deeply about text, or “anything that communicates a message,” as defined by the *KAS for Reading and Writing*. Throughout the sample tasks, readers engage in passages, videos, graphs, data sets, experiments or er forms of communication while processing and documenting their learning through writing.

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 to Learn in Mathematics Instruction

Implementing Writing to Learn in Mathematics Instruction

Writing to Learn in the mathematics classroom should be a regular occurrence. This type of writing provides opportunities for students to think metacognitively and organize their own thoughts with given information, share information with others for feedback and discussion, and continuously revise their thinking as they gain deeper understanding of the task and of mathematics in general.

Writing to Learn can promote student engagement and aid in developing a student's mathematical identity. Strategies that involve embedding systems and routines, such as Routines for Reasoning, allow students to engage in productive struggle and take ownership of their progress toward intended learning outcomes. While routines may vary across contexts, routines can help foster a sense of predictability and safety for students as they learn mathematics.

Writing to Learn strategies can engage students in learning that develops the voice and perspective necessary to engage with mathematics in the world beyond the classroom. When students Write to Learn, look for opportunities for them to respond to primary source documents, such as graphs or situations that deal with current world events. Consider facilitating Writing to Learn within tasks such as Data Talks or slow reveal graphs (demonstrated here). Writing to Learn strategies can even create a space to promote analysis of information, data and facts to help students make reasoned judgments, resulting in more responsible decision making.

Some additional examples of Writing to Learn strategies in the mathematics classroom could include, but are not limited to, the following[1]:

- I Notice, I Wonder Brainstorming
- Mathematical Language Routines such as:
    - Successive Pair Shares
    - Critique a Partial or Flawed Response
    - Always-Sometimes-Never
    - Co-Craft Questions
    - Co-Craft Situations
    - Numbered Heads Together

[1] Source: Understanding Language/Stanford Center for Assessment, Learning and Equity at Stanford University, is licensed under a Creative Commons Attribution 4.0 International License. 2017.

About the Writing to Learn in Mathematics Tasks in this Resource

These Writing to Learn sample tasks address Measurement and Data in Grade 2 and Modeling with Geometry in high school. Each sample shows how Writing to Learn is naturally embedded within a common mathematical instructional framework called Three-Act Tasks.

In Three-Act Tasks, Act 1 is a lesson launch, typically presenting a thought-provoking phenomenon for students to observe and pose questions as they ponder the situation. Writing to Learn in this stage helps students collect their noticings and wonderings about the thought-provoking phenomenon. Act 2 is a period of exploration in which students request clarifying data and then answer their own questions about what they observed in the first act. Students use Writing to Learn in Act 2 as they explore ways of answering their questions. Act 3 brings the problem to a conclusion and offers students the opportunity to reflect on their written solutions. See Math for All's description of Three Act Tasks for more information.

The purpose of these Writing to Learn tasks is to give students an opportunity to use informal writing exercises to capture their thinking, ultimately sharing through discussion in order to promote individual and collective learning and deepen understanding of content throughout the process of modeling with mathematics.

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 2 Writing to Learn Sample for Mathematics

Mathematics Content Standards Alignment	Standards for Mathematical Practice Alignment	Reading and Writing Standards Alignment	Interdisciplinary Literacy Practices Connections
Cluster: Relate addition and subtraction to length. **KY.2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units by using drawings and equations with a symbol for the unknown number to represent the problem. **Target of the Standard:** Conceptual Application	Students calculate the two different lengths based on the paths they will run. Students will make sense of who will win the race and how far they will run **(MP.1)** using a linear representation **(MP.4)**.	**RI.2.1** Ask and answer such questions as who, what, where, when, why, and how, and make and support logical inferences to construct meaning from the text. **C.2.6** Collect information from real world experiences or provided sources to answer or generate questions.	**ILP 1:** Recognize that text is anything that communicates a message. **ILP 8:** Engage in specialized, discipline-specific literacy practices.

Grade 2 Mathematics Task

Task: The Race

ACT 1: Engage and Perplex
After showing the 7-second video engaging students in a notice and wonder routine, ask, "What do you notice and wonder? Record their noticings and wonderings on chart paper. Some potential noticings and wondering could be:

- There are two girls.
- One girl is taller than the other.
- The girls are running.
- Why are the girls running?
- Where are they running to?
- Who will win the race?
- How far did each girl run?

Students record some of these on their Three-Act Task graphic organizer. Graham Fletcher's Version 3 graphic organizer for Three Act Tasks are suitable for use. Next, the teacher and students discuss and come to a consensus on what they would like to solve. They then estimate solutions, recording these on the graphic organizer. For example, if the class decides to focus on solving how far each girl ran, students would estimate a low and high number and then commit to the estimate on the number line provided on the recording sheet.

ACT 2: Seek Information and Solutions
In Act 2, students work on finding solutions to their problems through Writing to Learn. Provide students with the following directions:

We are trying to solve the question, "Where did they run?" Using the information provided in the Race Route and the additional information below, use strategies that make sense to you to help solve how far each girl ran and who won.

Additional information:

- The race started in the bottom right corner, and the girls started running left.
- The race finished in the same spot.

ACT 3: Reveal, Discuss, Extend (Extension Optional)

In Act 3, students share their written work, thinking and solutions with one another. If using the 3 Act Task graphic organizer, the teacher will direct students to sections 6 and 7 of the organizer as this is where they will be sharing their thinking from and also Writing to Learn when confirming or adjusting their arguments. Explain the purpose of Act 3 to the students by saying, "Now it is time to explain your conclusions to each other. You will get to share your thinking with classmates, and they will get to share their thinking with you. Listen closely as your classmates explain their arguments (or read their arguments closely) because it is your job to decide whether they make sense and ask useful questions to clarify or improve the arguments. (MP.3) You will confirm or adjust your thinking/arguments based on the discussions you have with your classmates." Allow time for students to engage in this communication and then reconvene as a whole class to bring conflicting ideas together and reconcile. This is also when the teacher will generalize the math involved and introduce formal mathematical vocabulary. Students continue to use Writing to Learn at this time as they make final adjustments, such as corrections to their math computation or applying a more efficient solution strategy, and additions, such as including formal math vocabulary, to their written work.

Grade 2 Mathematics Teacher Notes

Implementation Ideas for Act 3:

The student discussion time can be structured in a variety of ways. Consider these ideas:

- Students might compare their solutions to each other and to the reveal (if the teacher has shared the solution).
- Students might compare their solutions to their estimates and discuss the comparison.
- Students might discuss the assumptions that were made in the work.
- Students might think of other questions they could pursue next.

For additional insight around the alignment of the selected task to the *KAS for Mathematics*, access the Annotated Assignment Review Protocol. Designed to guide educators through the process of reviewing a single task/assignment by examining the alignment with the Mathematical Content alignment, engagement in the Mathematical Practices, attention to Relevance and analyzing Student Performance, the Assignment Review Protocol is intended to help teachers, leaders, and other stakeholders answer the question, "Does this task give students the opportunity to meaningfully engage in worthwhile grade-appropriate content?"

High School Geometry Writing to Learn Sample

Mathematics Content Standards Alignment	Standards for Mathematical Practice Alignment	Reading and Writing Standards Alignment	Interdisciplinary Literacy Practices Connections
Cluster: Apply geometric concepts in modeling situations. **KY.HS.G.30** Apply concepts of density based on area and volume in modeling situations, using appropriate units of measurement. **Target of the Standard:** Application For additional insight on standard KY.HS.G.30, access the Annotated Breaking Down a Standard Sample.	**MP.1: Make sense of problems and persevere in solving them.** Students start by explaining the meaning of a problem and look for entry points to its solution. They analyze given constraints, relationships and goals. **MP.4: Model with mathematics.** Students are able to identify important quantities in a practical situation. They can analyze relationships mathematically to draw conclusions. **MP.6: Attend to precision.** Students calculate accurately and efficiently and express answers with a degree of precision appropriate to the context.	**Supports learning toward:** **RI.9-10.1** Cite relevant and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. **C.9-10.6** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.	**ILP 2:** Employ, develop and refine schema to understand and create text. **ILP 6:** Collaborate with others to create new meaning. **ILP 8:** Engage in specialized, discipline specific literacy practices.

High School Geometry Task

Task: World's Largest Hot Coffee

ACT 1: Engage and Perplex

In Act 1, the teacher shares the 57-second video with the students.

The teacher poses questions to the class: "What do you notice? What do you wonder?" Students are encouraged to record their observations (perhaps using a graphic organizer) and generate questions to ask about the situation. The situation for this task is: The Gourmet Gift Baskets team wants to break the record for the biggest coffee cup. Once students have had the opportunity to independently consider the situation, students collectively decide on a question to focus on answering as a class and make estimates about the likely solution. In this example, the class asks, "How many gallons of coffee do you think will fit inside?" Below are suggested prompts to guide the process of making estimates:

- Guess as close as you can. Write your guess down.
- Write down a guess you know is too high.
- Write down a guess you know is too low.
- How long do you think it'll take them to fill up the cup?
- How many regular-size cups of coffee would fit inside that super-size cup of coffee?

ACT 2: Seek Information and Solutions

In Act 2, students work on finding solutions to their problems. Students use information they have and ask for more information as needed.

The task suggests asking students: What information would help solve this problem?

Resources provided that the teacher may share to support thinking:

- An image containing the dimensions of the cup
- A link to the news story about the old record
- An image conveying the rate at which the cup is filling up
- A link to the conversion from cubic feet to gallons
- A file containing the Guinness World Record guidelines

High School Geometry Task

ACT 3: Reveal, Discuss, Extend (Extension Optional)

In Act 3, students share their work, thinking and solutions. Once students have had the opportunity to formulate their thinking, allowing students to have discussion about their strategies can deepen understanding of content. The discussion can be structured in a variety of ways, including but not limited to, these ideas:

- Students might compare their solutions to each other's and to the reveal (if the teacher has shared the solution).
- Students might compare their solutions to their estimates and discuss the comparison.
- Students might discuss the assumptions that were made in the work.
- Students might think of other questions they could pursue next.

High School Geometry Teacher Notes

ACT 1: Engage and Perplex
Engaging students in tasks that promote mathematical reasoning and problem solving is a critical element of effective mathematics teaching. Teachers should consider how to offer all students an entry point into mathematics. In this case, Act 1 attempts to lower barriers to entry. As an additional strategy, educators can utilize routines, such as I Notice, I Wonder, which may support students as they

- Understand the story, the quantities and the relationships in the problem.
- Understand what the problem is asking and what the answer will look like.
- Have some ideas to begin to solve the problem.

The graphic organizer provides a brief, informal way to capture student thinking and learning and allows students to jot down their ideas to promote learning and understanding of content. After developing a class list of noticings and wonderings, decide on a question to focus on answering as a class and make estimates about the likely solution. After noticing and wondering, students should be able to:

- Tell the story of the problem in their own words.
- Give a reasonable estimate or high and low boundaries for the answer.
- Work independently on carrying out steps or generating more data toward solving the problem.

ACT 2: Seek Information and Solutions
During Act 2, students may use different ways to communicate and understand, such as objects, drawings, diagrams, charts, lists, graphic organizers, visual representations, etc. Within the graphic organizer, there is space for students to construct a viable argument (Standard for Mathematical Practice 3). Students understand and use stated assumptions, definitions and previously established results in constructing arguments.

ACT 3: Reveal, Discuss, Extend (Extension Optional)
Students justify their conclusions, communicate them to others and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Students at all grades can listen or read the arguments of others, decide whether they make sense and ask useful questions to clarify or improve the arguments. (MP.3) Ultimately, Act 3 is where the math is formalized and consolidated. Conflicting ideas are brought together and reconciled. Formal mathematical vocabulary is introduced.

For additional insight around the alignment of the selected task to the *KAS for Mathematics*, access the Annotated Assignment Review Protocol. Designed to guide educators through the process of reviewing a single task/assignment by examining the alignment with the Mathematical Content alignment, engagement in the Mathematical Practices, attention to Relevance and analyzing Student Performance, the Assignment Review Protocol is intended to help teachers, leaders, and other stakeholders answer the question, “Does this task give students the opportunity to meaningfully engage in worthwhile grade-appropriate content?”