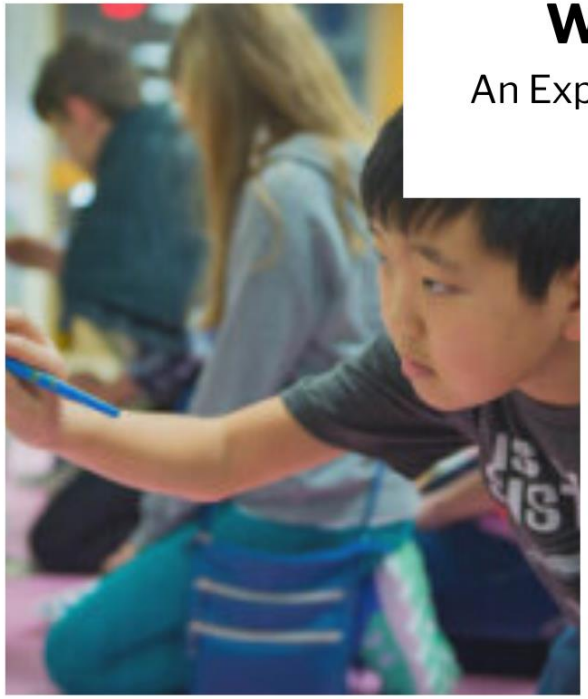


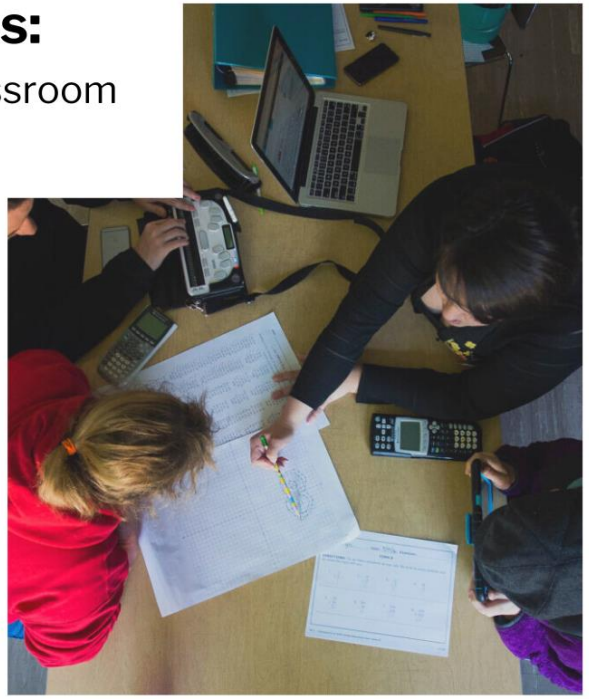
Kentucky Department of EDUCATION

Writing Across Discplines:

An Expansion of Composition in the Classroom

Fall 2023





What is Writing Across Disciplines?

What does "Writing Across Disciplines" mean?

Defining "Writing Across Disciplines" requires clarity around the terms "Writing" and "Across Disciplines." 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.

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

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 HQIR but 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 instruction through Writing to Learn, Writing to Demonstrate Learning and Writing for Publication. *Writing Across Disciplines*, however, contains sample discipline-specific 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, *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, a professional learning space that will hopefully both affirm and stretch educators' practices. The second release added Writing to Demonstrate Learning and the final release will include Writing for Publication.

Writing Across Disciplines is created to provide 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. *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 *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.

Writing TO DEMONSTRATE LEARNING Across Disciplines

Writing to Demonstrate Learning, as previously described, is necessary in every classroom for teachers to ascertain how well students are understanding the content, skills or concepts taught. Teachers use this type of writing to provide students opportunities for applying and demonstrating the skills they have learned in class and for assessing students' understanding of the subjects they are studying.

Regularly asking students to think and write about text at the higher levels of Bloom's Taxonomy (i.e., analysis, synthesis, evaluation) can help students not only think through the content but also reveal the depth of their knowledge. Though this kind of writing certainly can promote learning, it is especially used to help teachers understand how well students are learning. Typically, Writing to Demonstrate Learning takes the form of an academic exercise with the teacher as the primary audience and, thus, would not be suitable for publication. When students Write to Demonstrate Learning, their responses will be graded, marked or scored with a rubric to provide feedback to both the teacher and the student on their progress towards mastery. While feedback may focus on compositional or technical skills as a writer, teacher feedback usually focuses on content and conceptual understandings. Most simply stated, Writing to Demonstrate Learning is any composition intended to serve as a measurement of the student's depth of learning.

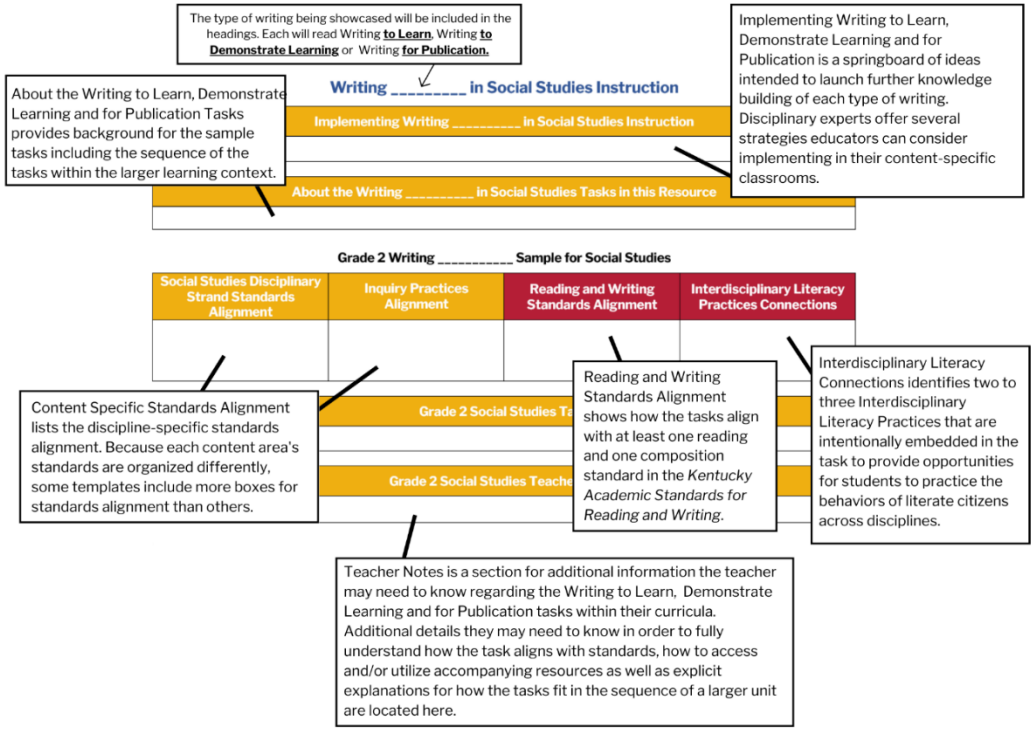
While students may demonstrate their learning through paragraphs or essays, at all ages, student composition should not be limited to traditional formats or restricted to writing on paper or drafting in a word processing document. Instead, students should have numerous opportunities to use digital resources to create, publish, research and update individual or shared products and to take advantage of technology's capacity to link to other information and to display information flexibly and dynamically. This may even require students to incorporate a variety of communication methods into one Writing to Demonstrate Learning composition.

Like Writing to Learn, Writing to Demonstrate Learning Across Disciplines refers to using Writing to Demonstrate Learning 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. The Writing to Demonstrate Learning section is the second of three sections that will make up the complete expansion and provides samples of Writing to Demonstrate Learning. 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 other forms of communication while processing and documenting their learning through Writing to Demonstrate Learning.

How to Read the Writing Across Disciplines 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 Demonstrate Learning in Science Instruction

Implementing Writing to Demonstrate Learning in Science Instruction

Writing to Demonstrate Learning in the science classroom provides students the opportunity to illustrate learning in meaningful ways. In the science field, learning is generally exhibited in peer-reviewed journal articles in which researchers share their findings and understanding about a phenomenon or problem with peers. Students may Write to Demonstrate Learning in the science classroom in many ways, including, but not limited to, the following **examples**:

- Data analysis
- Developing models images, flowcharts, analogies, mathematical equations)
- Designing solutions
- Constructing scientific explanations
- Constructing and/or critiquing scientific arguments

Science teachers engage students in Writing to Demonstrate Learning when they utilize the science and engineering practices (SEPs) as the vehicle for demonstrating understanding of the Disciplinary Core Ideas (DCIs) and Crosscutting Concepts (CCCs). These three dimensions compose the *Kentucky Academic Standards for Science*. Use of key SEPs not only provides the teacher with information about the students' understanding of a particular practice but also about their current understanding of the other two dimensions as they move towards mastery.

Teachers are also encouraged to leverage writing as a tool for deeper learning using Writing to Learn tasks described in Writing to Learn in Science.

About the Writing to Demonstrate Learning Tasks in this Resource

The Grade 5 unit on Space Systems begins with a phenomenon observed in a video of tree shadows in a forest. When watching this video, students will observe tree shadows changing direction while the sun appears to move in the sky over the course of the day. As students make observations of tree shadows, they will complete a notice and wonder t-chart (a Writing to Learn strategy) leading to the students asking questions related to the phenomenon such as, "Why do shadows move?" Leading up to this task, the students are actively engaged in collecting qualitative and quantitative data of the shadows (another Writing to Learn strategy) at regular intervals during the day from independent observations of the flagpole, sun and the flagpole's shadow. The students draw models of their observations and use a protractor to measure the altitude of the sun and represent the data in tables and graphs (again, a Writing to Learn strategy). From their data, the students will be able to identify patterns in the movement of the shadow and how the patterns relate to the movement of the sun. Following the collection and analysis of data, students will use Writing to Demonstrate Learning to synthesize and draw conclusions from their data as they look for patterns across all the data samples, keeping focused on the purpose of the observations, to answer, "Why do shadows change?"

In this high school unit on ecosystem dynamics, students are exploring how the population of large herbivores on the Serengeti plain has been changing rapidly since 1960, marked by a rapid increase of herbivores (buffaloes and wildebeests) and then a rapid decline of the buffaloes. Students begin by posing and recording questions to investigate (a Writing to Learn Strategy) related to the rapid increase and decline of the buffalo population in the Serengeti. Students develop an initial model and an initial hypothesis of what could explain the population changes. The students develop a plan to investigate each of their hypotheses and collect data (another Writing to Learn strategy) related to predator-prey relations, migrations, climate, human impacts and disease. Students explore and manipulate a simulation that helps them put together their ideas about the ecosystem dynamics and create models during the learning process as new information is revealed. This Writing to Demonstrate Learning task will allow students to synthesize what they have learned about the mechanisms of the Serengeti ecosystem through the development of a scientific model. More information about scientific models and their role in the instructional design process leading up to this Writing to Demonstrate Learning task are provided in the teacher notes section below.

Grade 5 Writing to Demonstrate Learning Sample for Science

Disciplinary Core Idea Alignment	Science and Engineering Practices Alignment	Crosscutting Concepts Alignment	Reading and Writing Standards Alignment	Interdisciplinary Literacy Practices Connections
ESS1.B: Earth and the Solar System The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.	***Constructing Explanations and Designing Solutions*** **- Construct an explanation of observed relationships** (e.g., the distribution of plants in the back yard). **- Use evidence** (e.g., **measurements, observations, patterns**) **to construct or support an explanation** or design a solution to a problem.	***Cause and Effect*** Cause and effect relationships are routinely identified, tested, and used to explain change.	**RI.5.9** Integrate information from several texts on the same theme or topic. **C.5.2** Compose informative and/or explanatory text, using writing and digital resources, to establish a topic and provide information about the topic.	**ILP 4:** Utilize receptive and expressive language arts to better understand self, others and the world. **ILP 8:** Engage in specialized, discipline specific literacy practices.

Grade 5 Science Task

Students will construct an explanation using evidence from their observations, angle measurements and noticeable patterns in response to the question, "Why do shadows change direction throughout the day?" Prompt students to demonstrate their learning through writing by assigning a task such as:

Use the evidence from the observations made over the past few days, patterns you identified, and angle measurements to construct an explanation to answer the question, "Why do shadows change direction throughout the day?"

Grade 5 Teacher Notes

Students will engage in Writing to Learn experiences throughout the instructional sequence in order to build knowledge about why shadows change. Writing to Demonstrate Learning is illustrated through the constructing of the scientific explanation as they synthesize information across all the data samples to answer the question. As they begin to think about the relationship (CCC: Cause and Effect) between the sun's movement across the sky and the movement of the shadows (DCI: ESS1.B Earth and the Solar System), the students use their data as evidence to support their thinking (SEP: Constructing Explanations). Teachers can use this task to formatively assess the students' ability to construct a scientific explanation as well as the students' current understanding of how the sun's movement across the sky causes observable patterns in the direction of shadows.

This learning is a progression of science ideas from the first grade. In the first grade, students learned that patterns of sunrise and sunset can be observed, described and predicted (1-ESS1-2). Students also learn that some materials block the light and form a shadow (1-PS4-3). Both of these ideas are prerequisites for this learning. If students do not have a good understanding of these concepts, teachers may need to build that understanding.

For more guidance on using this phenomenon and instructional moves see NSTA instructional materials: Tree Shadows Phenomenon.

High School Life Science Writing to Demonstrate Learning Sample

Disciplinary Core Idea Alignment	Science and Engineering Practices Alignment	Crosscutting Concepts Alignment	Reading and Writing Standards Alignment	Interdisciplinary Literacy Practices Connections
LS2.C: Ecosystem Dynamics, Functioning, and Resilience **A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modes biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (I.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any populations, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.**	***Developing and Using Models*** **Develop**, revise, and/or use **a model based on evidence to illustrate** and/or predict **the relationships** between systems or **between components of a system**.	***Cause and Effect: Mechanism and Prediction*** **Empirical evidence is required to** differentiate between cause and correlation and **make claims about specific causes and effects.** ***Stability and Change*** **Much of science deals with constructing explanations of how things change and how they remain stable.** .	**Supports instruction toward:** **RI.9-10.7** Analyze various accounts of a subject presented in different print and non-print formats, determining* which details are emphasized in each account. *Determining which details are emphasized in an account is a prerequisite skill for synthesis. Students synthesize information from various print and non-print accounts in this lesson. **C.9-10.2** Compose informative and/or explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization and analysis of content.	**ILP 1:** Understand that text is anything that communicates a message. **ILP 8:** Engage in specialized, discipline-specific literacy practices.

High School Life Science Task

In this storyline, students are exploring what is happening to the large herbivores in the Serengeti by examining predator-prey relations, migrations, climate, human impacts, and disease. After learning about the decline of water buffalo on the Serengeti via data, videos and reading, students explore possible causal mechanisms for the change in population in both the buffalo and the wildebeest. After completing the series of lessons focused on the Serengeti ecosystem dynamics, prompt students to demonstrate their learning through writing with the task below:

Consider the storyline about what is happening to the large herbivores in the Serengeti and data collected from texts and computer simulations. Use what you have learned to develop a scientific model that demonstrates your understanding of the mechanisms of the Serengeti ecosystem and the possible cause of the population change on the Serengeti. Use images, labels, and words to clearly communicate the possible cause(s) of the population change.

High School Life Science Teacher Notes

Scientific models are sense-making tools that help us predict and explain the world. The **scientific model** in this task is used to show relationships between components of the system and provide a mechanistic account within that system. Scientists use models to demonstrate their current understanding of a system being studied, to help develop questions and explanations, and to communicate their ideas with others. For students to engage in the Writing to Demonstrate Learning task, they must first engage in learning about the system being studied. Once the students have collected data on the system, they will use their model to explain how the parts of the system are interconnected and communicate their ideas. The written component may be a formal explanation, descriptions of mechanistic factors, or other necessary support to communicate the intended meaning of the scientific model. Finally, in the subsequent lesson, students will use their developed models to consider how they may apply to other ecosystems.

This Writing to Demonstrate Learning task provides the teacher with information not only in students' ability to model, but, through the model, student understanding of the mechanisms which result in change in the Serengeti ecosystem. Writing to Demonstrate Learning is illustrated in this task through the development of a model (SEP: Developing and Using Models) to show possible causal mechanisms, and their results (CCC: Cause and Effect) on the Serengeti ecosystem (DCI: Ecosystem Dynamics, Functioning and Resilience).

The Serengeti ecosystem storyline provides an overview of the individual lessons, which includes specific phenomena, what students are figuring out, new questions and next steps. The task above represents what students would complete during Lesson 9 of the storyline. For the full unit, including data, readings and teacher guidance, access Ecosystems Unit Bend 1: Serengeti. For a sample modeling rubric, and student samples, see Modeling Rubric (SLO) (pages 6-8). For more information about scientific modeling, see The Framework for K-12 Science Education.