

Teacher's Supplement

muse®

APRIL 2016

MAGAZINE ARTICLES

- Defenses Gone Haywire14
Expository Nonfiction 900L
- Wasting Away18
Expository Nonfiction 1180L
- Magic Potions24
Fantasy/Science Fiction 940L
- The Deadliest Poison on Earth42
Expository Nonfiction 1130L
- Deadly Nightshade45
Narrative Nonfiction 990L

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Teacher's Guide for *Muse: The Dose Makes the Poison*

Using This Guide.	2
Common Core: Reading, Speaking & Listening, and Writing	3
Article Pages.	4
Cross-Text Connections with Multiple Articles	9
Mini-Unit	10
Printables.	13
Glossary	17
Online Resources	19



OVERVIEW

In this magazine, readers will learn that virtually any substance can be poisonous depending on the dose that is administered.

Muse: The Dose

Makes the Poison includes information about the body's natural defenses and the importance of setting dosing and waste guidelines. Furthermore, this issue explores the past and present practice of using toxins to achieve beauty goals.

ESSENTIAL QUESTION:

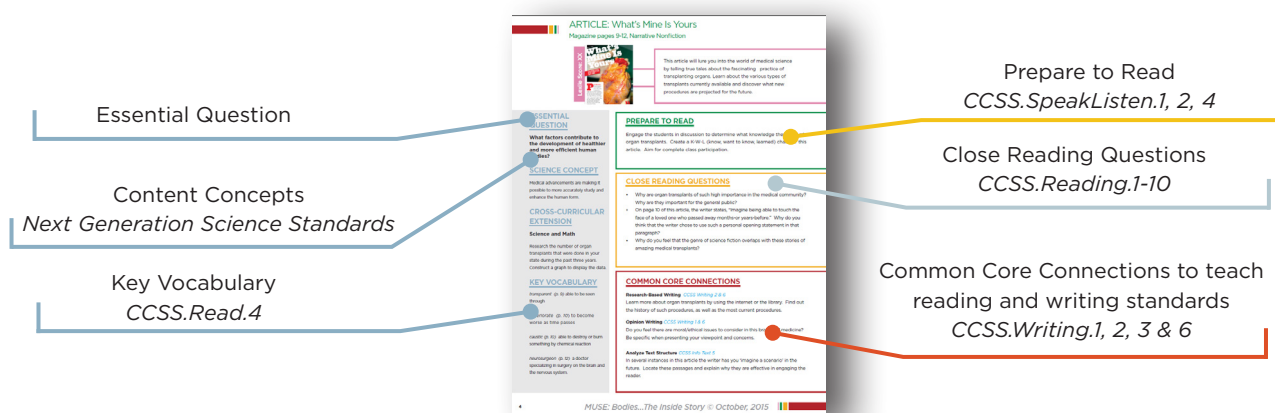
How can altering the amount of a substance determine whether it is beneficial or harmful?



We invite you to use this magazine as a flexible teaching tool that is ideal for interdisciplinary learning of social studies and science content and core literacy concepts. Find practical advice for teaching individual articles or use a mini-unit that helps your students make cross-text connections as they integrate ideas and information.

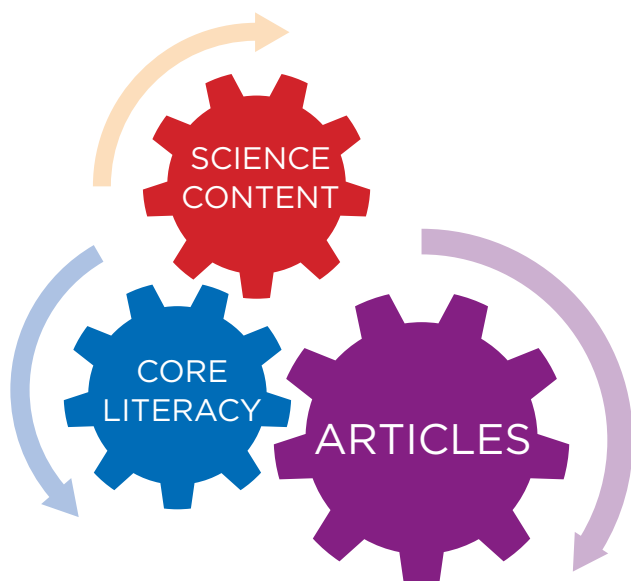
READ MULTIPLE ARTICLES PAGES 4 - 8

Each article in this magazine is well-suited for teaching Common Core literacy concepts and content area knowledge. For each individual article page in this guide, you'll find the following:



TEACH A MINI-UNIT PAGES 10 - 12

Magazine articles can be easily grouped to make cross-text connections and comparisons. Our Common Core mini-unit guides students to read and discuss multiple articles and integrate ideas and information (CCSS.ReadingInfoText.9). Discussing multiple articles (CCSS.SpeakListen.1, 2, 4) prepares students to write informational texts to share and publish in a variety of ways (CCSS.Writing.2).



READING

Core literacy concepts, such as the ones found in the Common Core State Standards, help students access social studies and science content. Integration of both literacy thinking and content study offers students a great way to become experts in reading informational text and literature for content knowledge. This guide provides questions to cover many core literacy concepts.

Draw Inferences (*CCSS.InfoText.1*)

Describe Relationships (*CCSS.InfoText.3*)

Analyze Text Structure (*CCSS.InfoText.5*)

Interpret Visual Information (*CCSS.InfoText.7*)

Summarize (*CCSS.InfoText.2*)

Determine Word Meaning (*CCSS.InfoText.4*)

Understand Author's Point of View (*CCSS.InfoText.6*)

Explain Reasons and Evidence (*CCSS.InfoText.8*)

FOCUS STANDARD: CCSS.InfoText.9: Integrate Ideas and Information

Have students read multiple articles on the same topic from this magazine to build knowledge and make cross-text comparisons.

SPEAKING AND LISTENING

Use the articles in this magazine to spark meaningful discussions in person and online. Encourage deeper discussions where students can become topic experts (*CCSS.SpeakListen.1, 2, 4*).

DISCUSSION OPTIONS—IN CLASS OR ONLINE

Article Clubs: Form small reading groups of students reading the same article. Have students discuss the content, share ideas, and critically evaluate the text.

Jigsaw Clubs: Form small reading groups of students reading *different* articles. Invite students to share information and resources with each other.

Whole Class: Launch with an essential question. Encourage students to find and share evidence from different articles to build a greater understanding of the question.

WRITING

Use the articles in this magazine to prompt **informative/explanatory writing** (*CCSS.Writing.2*). Have students use evidence from the texts to share information about social studies, language arts, or science content. See the **Mini-Unit** section of this guide (pgs. 10 – 12) as well as the **Article Pages** (pgs. 4 – 8) for ways to incorporate writing into your instruction.

ARTICLE: Defenses Gone Haywire

Magazine pages 14 - 17, Expository Nonfiction



Could there be an upside to nausea and disgust? Research shows that our ancestors used these reactions to protect their health and potentially save their lives. Learn how this evolutionary history left humans with overactive defense mechanisms.

ESSENTIAL QUESTION

How can altering the amount of a substance determine whether it is beneficial or harmful?

SCIENCE CONCEPT

Organisms maintain a dynamic equilibrium that sustains life.

CROSS-CURRICULAR EXTENSION

Health & Safety

Learn more about our immune system and natural defenses. How do they help keep us healthy and safe?

KEY VOCABULARY

aversion (p. 16) a strong feeling of dislike

churn (p. 16) to stir or mix something with force

posit (p. 17) to suggest an idea or theory

purge (p. 15) to cause something to leave the body

scavenging (p. 15) searching for waste

PREPARE TO READ

Give the students a few moments to discuss any “overreactions” they may have to a particular food’s taste, smell or texture. Can they pinpoint the cause of their aversion? Discuss the commonalities and generate a list to revisit after reading “Defenses Gone Haywire.”

CLOSE READING QUESTIONS

- How does the first sentence of this article (“You probably don’t consider eating hazardous”) catch the reader’s attention?
- What does the article suggest is the downside of our defensive systems?
- How can we change our responses to instinctive reactions?
- Explain how disgust can keep us away from danger.

COMMON CORE CONNECTIONS

Interpret Visual Information *CCSS Info Text 7*

Examine the graphic feature on page 16 and describe how it helps enhance your understanding of the content.

Discuss Relationships *CCSS Info Text 3*

Describe the relationship between your health and your instinctive defensive systems. Explain how this relationship can be positive or negative depending on other factors.

Explain Reasons and Evidence *CCSS Info Text 8*

The author begins the second paragraph by stating that some defenses help us purge toxins. What evidence does the writer use to support that statement?



Take an imaginary journey into the distant future to ensure that mankind is protected from our nuclear waste. Read this article to discover how language, art and physical construction will play a role in keeping future generations safe from radioactive contaminants.

ESSENTIAL QUESTION

How can altering the amount of a substance determine whether it is beneficial or harmful?

SCIENCE CONCEPT

Human decisions and activities have had a profound impact on the physical and living environment.

CROSS-CURRICULAR EXTENSION

Social Studies

Research examples of times when humans have been harmed by their own failure to secure radioactive waste.

KEY VOCABULARY

encapsulating (p. 21) completely covering something

generate (p. 20) to produce

radioactive (p. 19) having or producing a powerful form of energy

reclaimed (p. 20) to make something available for use by changing its condition

repository (p. 20) a place where something is stored

PREPARE TO READ

Pose the following question: "In what ways are we morally responsible for the safety and health of future generations?" Compile a list of responses and urge the students to suggest methods for warning future civilizations. Make note of any disagreements about where the responsibility lies.

CLOSE READING QUESTIONS

- How does the question under the title ("How do we protect people in the distant future from our nuclear waste?") prepare the reader for the text ahead?
- What are some of the ways that we currently generate radioactive waste? Discuss the consequences of ineffectively disposing of hazardous waste.
- What is the difference between low-level and high-level waste?

COMMON CORE CONNECTIONS

Summarize Main Ideas *CCSS Info Text 2*

Discuss the two biggest ideas in this article with a partner. Write a brief summary and include a question that you can investigate further.

Describe Relationships *CCSS Info Text 3*

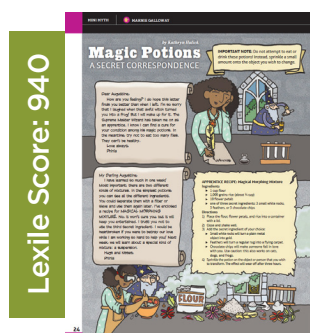
Reread the article and list ways that our present behavior will affect many future generations.

Opinion Writing *CCSS Writing 1 & 6*

Do you feel we have a moral obligation to secure dangerous materials? Use details to support your answer.

ARTICLE: Magic Potions: A Secret Correspondence

Magazine pages 24 - 26, Fantasy/Science Fiction



Enjoy reading secret correspondence between Augustina and Phinia. Enter the world of magic potions, morphing creatures and marvelous mixtures. Would you dare to be the Supreme Master Wizard's Apprentice?

ESSENTIAL QUESTION

How can altering the amount of a substance determine whether it is beneficial or harmful?

SCIENCE CONCEPT

Analyze how the different sections of the article contribute to the whole and to an understanding of the topic.

CROSS-CURRICULAR EXTENSION

Mathematics

Highlight all the numbers and mathematical concepts used in the text. Explain how using math was essential.

KEY VOCABULARY

apprentice (p. 24) a person who learns a skill by working for a master of that skill

morphing (p. 24) gradually changing into a different image

suspension (p. 24) the act of making something ineffective or invalid

PREPARE TO READ

Prepare to read the article by instructing the class to gather in small groups to discuss stories they have read in the genre of fantasy science fiction. Discuss common themes (magic, apprenticeship, etc.). Ask the class to consider the title "Magic Potions: A Secret Correspondence" and challenge them to make predictions about the text.

CLOSE READING QUESTIONS

- What devices does the author use to create a mood of fantasy in the text?
- How does the author organize the ingredients and procedures for her recipes?
- How do you know this is fantasy/science fiction? Share examples from the story.

COMMON CORE CONNECTIONS

Analyze Text Structure *CCSS Info Text 6*

Do you think that the author's use of secret correspondence to present this information is ideal? Why/why not?

Draw Inferences *CCSS Info Text 1*

Notice the similarities and differences in the recipes. What can you infer that the author wished to convey with the wording?

Discuss Relationships *CCSS Writing 2, 6 & 7*

What is the relationship between the main characters in the story? Which specific sentences give you this information?

ARTICLE: The Deadliest Poison on Earth

Magazine pages 42 - 45, Expository Nonfiction



It may surprise you to learn that many people willingly inject themselves with the deadliest poison on the planet. Botulinum toxins (medically referred to as Botox) have a history of making people fatally sick through food poisoning. They have also been studied for potential military use, and more recently for therapeutic purposes. Delve into his article to discover how “the dose makes the poison.”

ESSENTIAL QUESTION

How can altering the amount of a substance determine whether it is beneficial or harmful?

SCIENCE CONCEPT

A mixture is a unification of substances where the properties of the original substances remain unchanged.

CROSS-CURRICULAR EXTENSION

Health & Safety

Compile a list of potentially dangerous beauty trends, as well as a list of safe alternatives.

KEY VOCABULARY

extract (p. 43) a substance that you get from something by using chemicals or a machine

lethal (p. 43) causing or able to cause death

rampant (p. 43) growing quickly in a way that is difficult to control

resounding (p. 44) very definite

PREPARE TO READ

Have the students talk about the extensive list of side effects that accompany modern-day medicines. (If possible, bring in copies of over-the-counter or prescription informational sheets for the class to peruse.) What conclusions can students draw about these substances that we call cures?

CLOSE READING QUESTIONS

- What are the deadliest toxins on Earth? Use comparisons to show how deadly they are.
- Locate sentences in the article in which the author attempts to shock the reader. How does this technique contribute to the tone of the text?
- Explain the meanings of the three subtitles in the text.

COMMON CORE CONNECTIONS

Author's Point of View *CCSS Info Text 6*

Can you ascertain the author's viewpoint about using toxins in warfare? Which specific sentences give you this information?

Summarize Main Ideas *CCSS Info Text 2*

What are the main ideas of the article? Summarize the information, rewriting it so that you can share it with a younger audience.

Opinion Writing *CCSS Writing 1 & 6*

Why do you think people are willing to risk their health to be more “beautiful”? Is the pressure self-imposed or created by society? Is it more severe for men or women?



Travel back in time to the Middle Ages and learn about the deadly nightshade berries that were being used as a beauty aid. The downside to achieving the desirable “wide-eyed, dreamy stare” included blindness, paralysis and hallucinations. Read this article to discover why *Atropa belladonna* is also known as witches’ berry.

ESSENTIAL QUESTION

How can altering the amount of a substance determine whether it is beneficial or harmful?

SCIENCE CONCEPT

In all environments, organisms interact with one another in many ways.

CROSS-CURRICULAR EXTENSION

Careers in Science

Explore a day in the life of a biologist. What kind of work do they perform and why is their work so important?

KEY VOCABULARY

antidote (p. 45) a substance that stops the harmful effects of a poison

conjure (p. 45) to make something appear or seem to appear by using magic

dilated (p. 45) to become larger

PREPARE TO READ

Build background by creating a class chart listing potentially harmful products/procedures that are used and performed in the name of beauty. Pose the question: “How do you think people assess the reward/risk benefits?” Discuss the phrase “blinded by beauty.”

CLOSE READING QUESTIONS

- Why are the berries and leaves of *Atropa belladonna* potentially dangerous?
- How does this article support the title of this issue, *The Poison is in the Dose*?
- How does the author’s knowledge of history contribute to the article? Give examples from the text.

COMMON CORE CONNECTIONS

Discuss Relationships *CCSS Info Text 3*

What is the relationship between nature and medicine? How can that relationship be both positive and negative?

Author’s Point of View *CCSS Info Text 6*

How does the manner in which this article is written convey the author’s passion for the subject? Explain how you can discern this.

Opinion Writing *CCSS Writing 1*

Write an opinion piece about cultural views of beauty and the risks you are willing or not willing to take.

CROSS-TEXT CONNECTIONS WITH MULTIPLE ARTICLES

COMPARE ARTICLES

SYNTHESIZE: Guide students to compare articles they read. Help students find the connections between pieces of information in multiple texts. Use prompts, such as the following examples, to have students work together to **Integrate Ideas and Information** (CCSS.*Reading.9*).

- The articles “The Deadliest Poison on Earth” and “Deadly Nightshade” both address the use of toxins in beauty treatments. Debate the potential benefits and risks of the treatments discussed. Explore how society often dictates what is considered “beautiful.”
- The article “Magic Potions: A Secret Correspondence” is written in a starkly different style than the other feature articles. How does the variety of writing techniques help the reader connect with the material?
- Gather information from the articles within this issue that supports the title *The Dose Makes the Poison*. Generate a list of specific passages that reinforce this idea. Explain specifically how the passages relate to the title.
- Reread the feature articles and highlight sections that contain historical and scientific data. Examine the interconnectedness of history and the sciences. List the reasons that this information overlaps. Additionally, are there other fields of study represented in this issue of Muse?
- Use information from the feature articles to locate the sources (manmade vs. nature) of poisons mentioned. Why do we need to be diligent in setting dosing and waste guidelines, regardless of the substance’s origin?

EXPLORATORY LEARNING - FLEXIBLE MINI-UNIT DESIGN

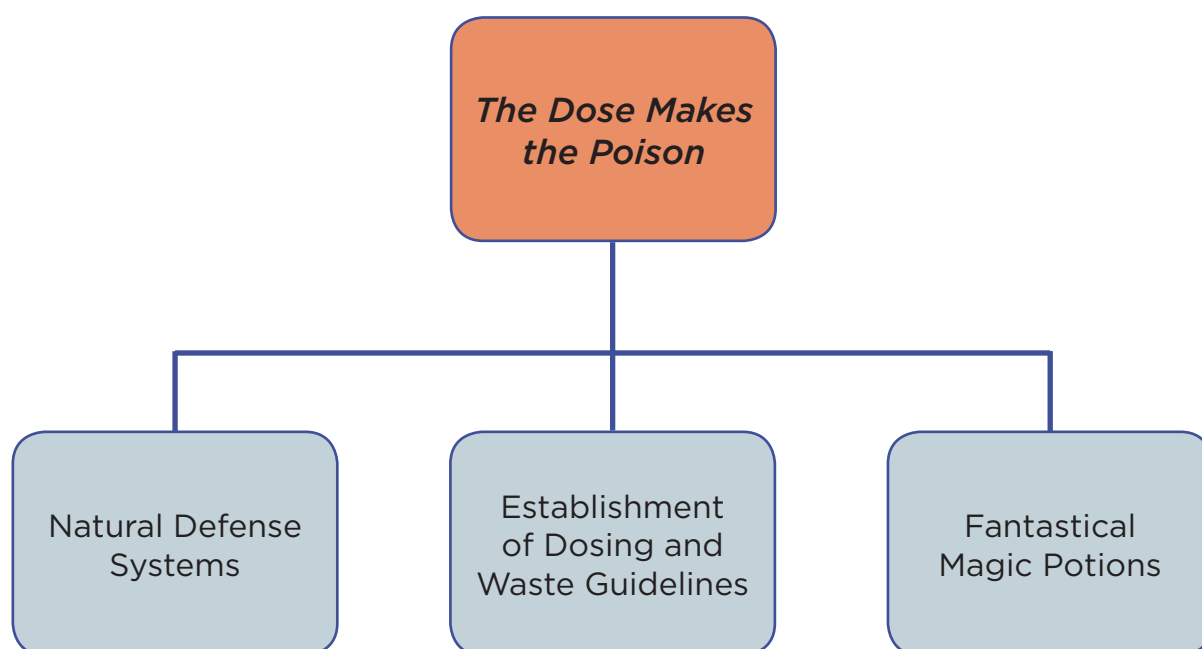
This mini-unit is designed as a flexible teaching tool that can be taught in any order. It lends itself well to the articles mentioned within or you may choose to substitute your own selection of articles. It would be beneficial to gauge the interest level of your students when determining your focus.

ENGAGE

**READ AND
COMPARE**

APPLY

ENGAGE: Engage the class in the topic of poisonous substances. Have students page through the magazine looking at graphic features and reading article titles to spark a readiness to read. Discuss the interconnectedness of miraculous cures and deadly poisons. Create a concept web to display prior knowledge.



Share the essential question:

How can altering the amount of a substance determine whether it is beneficial or harmful?



READ AND COMPARE ARTICLES: Begin with a focus article as a base for building content knowledge and model how to work through the text.

1) READ ALOUD: Use “Defenses Gone Haywire” on pgs. 14 -17 as a focus article, or choose a different article that works well for your teaching goals. Share the article summary on page 4 of this guide. Students can read their own copies of the article and use sticky notes to mark places they find interesting or have questions about.

2) DISCUSS THE ARTICLE: After reading “Defenses Gone Haywire,” guide students to talk about the article. See the Article Pages for Close Reading Questions to enhance the material.

3) READ NEW ARTICLES: Help students choose additional articles to read based on their inquiry questions or what they find interesting. Refer to the Article Pages for summaries of each article within *Muse: The Dose Makes the Poison*.

4) COMPARE ARTICLES: After students have read multiple articles, guide them to make cross-text connections. Refer to page 9 to Compare Articles using prompts that help students integrate ideas and information.

CHOOSE A PURPOSE FOR READING

CLOSE READ *CCSS Reading Info Text 1* Mark the text, noting important details and highlighting what interests, surprises, or confuses you.

UNDERSTAND MAIN IDEAS TO DEVELOP EXPERTISE *CCSS Reading Info Text 2* Record the main ideas in a second article. Note how these main ideas build on the main ideas from the focus article. How is your topic knowledge growing?

REVIEW GRAPHIC FEATURES *CCSS Reading Info Text 7* Examine graphic features within this issue and describe how the images, charts, and photographs enhance your understanding of the content.



APPLY: MIRACULOUS CURE OR DEADLY POISON?

Focus on the essential question (“How can altering the amount of a substance determine whether it is beneficial or harmful?”) and return to the feature articles to formulate possible responses. Divide the class into different groups to discuss, debate and study different facets of this question. Use the activities below to further immerse your students in the material presented in this issue of *Muse*.



- **Group One:** Have students read various articles from *Muse: The Dose Makes the Poison* and then complete the ABC organizer from the Printables section of this guide. Remind students to use vocabulary words, concepts, names and ideas from throughout the magazine. Also remind them to list the word and its definition/contribution in the appropriate box, and include the page number from the original article. Guide students in locating reliable definitions and working collectively to complete the ABC organizer. Lastly, instruct students to provide a brief summary of each article to accompany their organizer.



- **Group Two:** This issue of *Muse* examines toxins found in nature as well as man-made poisons. Research on these contaminants has proven that there can be many positive benefits to these substances, in addition to serious adverse consequences. Instruct students to work with their group to compile a list of the poisons discussed in the feature articles and construct a chart for comparing both the positive and negative effects of each. Then, have them use the information from their chart to create a comprehensive essay that can be shared with the class. Remind them to include details about their research that support their statements.



- **Group Three:** Prompt students to discuss the following questions about the interconnectedness of science and beauty. How does the medical field impact the beauty industry? What are the moral issues that need to be considered as newer therapeutic/beauty procedures incorporate the use of potentially lethal substances? When is it necessary to enforce guidelines and restrictions on our quest for “beauty”? Instruct students to use the Venn diagram in the Printables section to help them organize their ideas.

ABC Organizer/Word Study
Muse: The Dose Makes the Poison

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	XYZ

NAME: _____

Mini-Unit Graphic Organizer

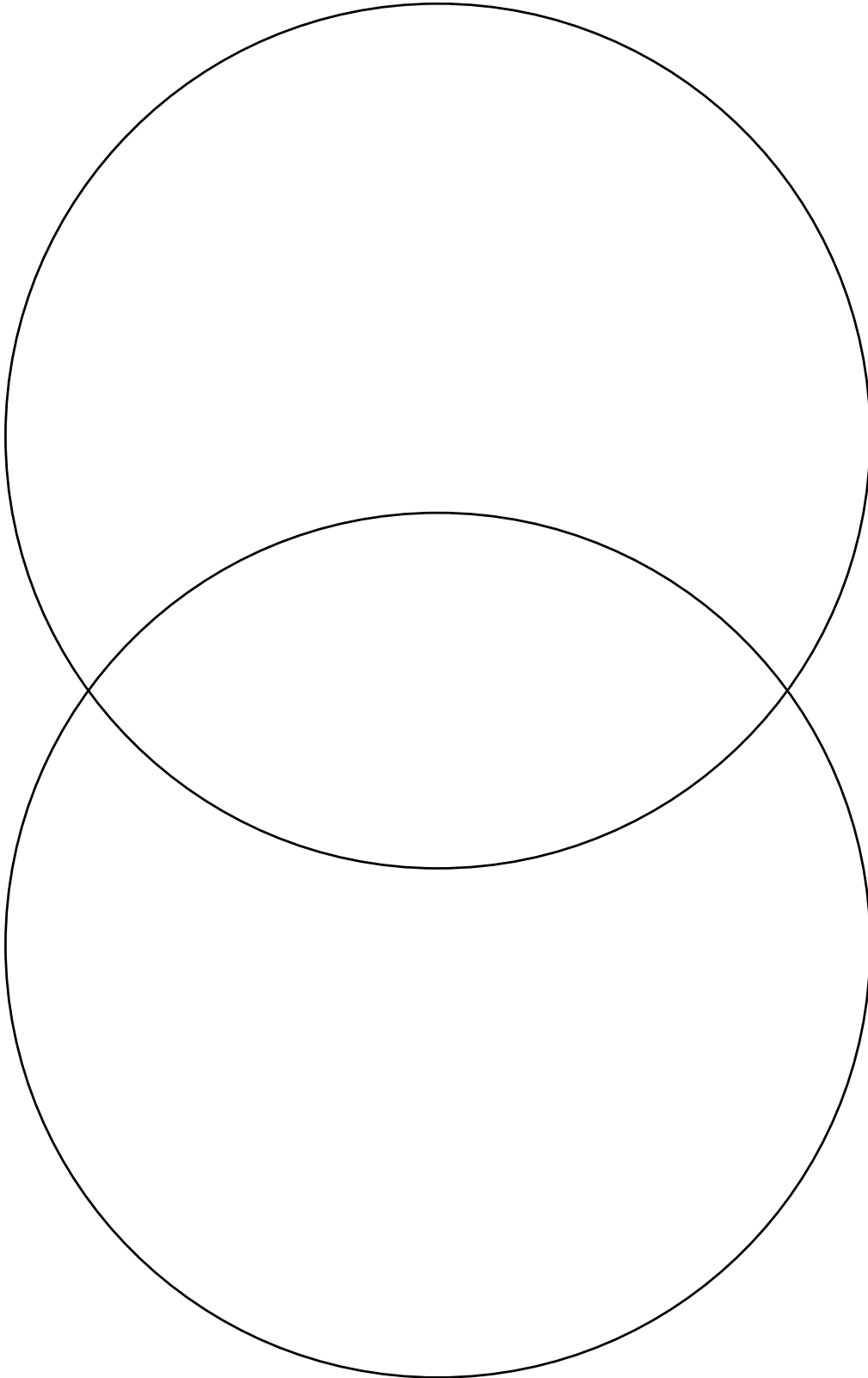
NAME: _____

Mini-Unit Graphic Organizer

Venn Diagram

POISON

CURE



NAME: _____

ANALYZE GRAPHIC FEATURES

GRAPHIC FEATURE	PAGE LOCATION	HOW THIS FEATURE HELPED YOUR UNDERSTANDING

NAME: _____

CONCEPT CHART

Show how reading multiple articles developed your understanding of the essential question or your own inquiry question.

ESSENTIAL QUESTION OR INQUIRY QUESTION:

ARTICLE 1:

ARTICLE 2:

ARTICLE 3:



antidote a substance that stops the harmful effects of a poison

*Atropine is an **antidote** against poisoning from some insecticides, such as parathion, and some nerve gases used as military weapons. (p. 45)*

apprentice a person who learns a job/skill by working for a fixed period of time for someone who is very good at that job/skill

*The Supreme Master Wizard has taken me on as an **apprentice**. (p. 24)*

aversion a strong feeling of dislike

*Scientists call this a conditioned (or learned) taste **aversion**. (p. 16)*

churn to stir or mix something with force

*For years afterward, the smell of pickles made my stomach **churn**. (p. 16)*

conjure to make something appear or seem to appear by using magic

*That may be the origin of a tale in German folklore about witches using nightshade to **conjure** up werewolves. (p. 45)*

dilated to become larger or wider

*A few drops in the eyes **dilated** the pupils, leading to a wide-eyed, dreamy stare that was fashionable at the time. (p. 45)*

encapsulating completely covering something especially so that it cannot touch anything else.

*As time goes on, the salt will move down around special disposal drums, **encapsulating** the waste even tighter. (p. 21)*

extract a substance that you get from something, by using chemicals or a machine

*He created toxic **extract** from poisonous sausages and fed it to a variety of animals to determine how the toxin worked. (p. 43)*

generate to produce or cause something to be produced

*"We **generate** so much (nuclear) waste in the United States and what's important is that we properly and responsibly manage this waste," says Mark Walker. (p. 20)*

lethal causing or able to cause death

*The stuff is over a million times as **lethal** as arsenic, 300,000 times more toxic than cyanide, and almost 10,000 times more deadly than tetrodotoxin. (p. 43)*

morphing gradually changing into a different image

*I've enclosed a recipe for Magical **Morphing** Mixture. (p. 24)*

posit suggest an idea or theory, especially in order to start a conversation

*Now that parasites and venomous attacks are rare, this theory **posits**, it keeps busy by attacking harmless proteins instead. (p. 17)*

purge to cause something to leave the body

*Some defenses help us **purge** toxins. (p. 15)*

radioactive having or producing a powerful form of energy (known as radiation)

*The sign is part of a long-term plan to warn future humans about the dangers lurking below from still-active **radioactive** waste buried thousands of years before, by us. p. (19)*

rampant growing quickly in a way that is difficult to control

*In eighteenth to nineteenth century Germany, hard times led to poor food hygiene and **rampant** food poisoning. (p. 43).*

reclaimed to make something available for use by changing its condition

*Places that have been contaminated can be **reclaimed** - the Rocky Flats Plant in Colorado, which made nuclear weapons for almost 40 years, is now a wildlife refuge. (p. 20)*

repository a place where a large amount of something is stored

*The company has a low-level waste **repository** in a remote area of Utah. (p. 20)*

resounding very definite

*His research was a **resounding** success. (p. 44)*





scavenging searching for waste for something that can be saved, used or eaten

*Staying full meant **scavenging** food on the edge of spoiling. (p. 15)*

suspension the act of making something ineffective or invalid, usually for a short amount of time

*Next week, we will learn about a special kind of mixture: a **suspension**. (p. 24)*



“Defenses Gone Haywire”

- <http://www.neok12.com/video/Allergies/zX587f4f00055d4170020045.htm>

Watch an informational video depicting the human immune response systems.

- <http://www.psychpage.com/learning/defenses.html>

Learn how various archaic defense systems protect but also hinder humans.

“Wasting Away”

- <http://www.americanenergyindependence.com/nuclearwaste.aspx>

Read an interesting article claiming that future generations with increasing technology will know how to keep humans safe from the effects of nuclear waste, as long as we store it safely today.

“Magic Potions: A Secret Correspondence”

- <http://kathrynulick.com/>

Learn more about the text’s author and peruse her collection of books and articles.

“The Deadliest Poison on Earth”

- <http://topyaps.com/top-10-deadliest-poisons>

Review a “top ten” list of deadliest poisons. Sources, photos and details of their deadly effects are included.

“Deadly Nightshade”

- <http://www.mnn.com/your-home/organic-farming-gardening/photos/13-plants-that-could-kill-you/deadly-plants#top-desktop>

Read about the 15 deadliest plants found in nature. Explanations, locations and photographs of the plants are included.