Into the Humanities: Logical Reasoning Beyond Science and Math

Grades

●10–12, adaptable, especially appropriate for AP English Language and college-level high school argument or debate **Teacher-In-Residence** ● Casey Reynolds

Subjects

•English Language Arts, Philosophy, French, Math, Art History, Visual Art, Chemistry

Carnegie Museum of Art

Goal

The overarching goal is for students to think and write critically using logic and be able to identify and evaluate whether and how well others use such reasoning.

Objectives

As a result of this multi-day, interdisciplinary lesson, students will be able to:

• Verbally pronounce, use, and translate some introductory French terms and names

• Identify differences between inductive and deductive reasoning and apply each to practical examples

• Differentiate between inductive and deductive reasoning and evaluate artists', writers', and speakers' use of them

• Identify and analyze claims, data, and warrants in arguments

- Identify and explain how logic applies to fields of study in multiple disciplines
- Discuss openly, constructively, and critically about art conservation from a scientific perspective (extension)

Standards

English Language Arts

• **CC.1.2.9–10.D** Determine an author's particular point of view and analyze how rhetoric advances the point of view.

• **CC.1.2.11–12.D** Evaluate how an author's point of view or purpose shapes the content and style of a text.

• **CC.1.2.11–12.E** Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.

• **CC.1.2.9–10.F** Analyze how words and phrases shape meaning and tone in texts.

• **CC.1.2.11–12.F** Evaluate how words and phrases shape meaning and tone in texts.

• **CC.1.2.11–12.G** Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. • **CC.1.2.9–10.H** Delineate and evaluate the argument and specific claims in a text, assessing the validity of reasoning and relevance of evidence.

• **CC.1.2.11–12.H** Analyze seminal texts based upon reasoning, premises, purposes, and arguments.

• **CC.1.2.11–12.J** Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

• **CC.1.3.11–12.D** Evaluate how an author's point of view or purpose shapes the content and style of a text.

• **CC.1.3.11–12.E** Evaluate the structure of texts including how specific sentences, paragraphs, and larger portions of the texts relate to each other and the whole.

Standards

• **CC.1.3.9–10.J** Acquire and use accurately grade appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

• **CC.1.4.9–10.F** Demonstrate a grade-appropriate command of the conventions of standard English grammar, usage, capitalization, punctuation, and spelling.

• **CC.1.4.11–12.H** Write with a sharp, distinct focus identifying topic, task, and audience. Introduce the precise, knowledgeable claim.

• **CC.1.4.9–10.I** Distinguish the claim(s) from alternate or opposing claims; develop claim(s) fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.

• **CC.1.4.9–10.J** Create organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence; use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims; provide a concluding statement or section that follows from and supports the argument presented.

• **CC.1.5.9–10.B** Evaluate a speaker's perspective, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.

Arts and Humanities

9.3.12.A. Explain and apply the critical examination processes of works in the arts and humanities.
Compare and contrast • Analyze • Interpret • Form and test hypotheses
Evaluate/form judgments

Science and Technology

• **3.2.12.A** Evaluate the nature of scientific and technological knowledge. • Know and use the ongoing scientific processes to continually improve and better understand how things work

Standards

PA Mathematics Objectives

• 2. Use effective mathematical reasoning to construct viable arguments and critique the reasoning of others

• 5. Make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problemsolving strategies.

Materials

- Color printer/ color copies of the pieces of the artwork (below), cut
- Markers (at the very least the three primary colors are best, but a full array of colors is not necessary)
- Computer with projector or SmartBoard
- Links to artwork (below)
- Google Slideshow (linked here)
- Logical Reasoning worksheet (below)
- Carnegie Museum of Art (resource)

Vocabulary

English Vocabulary

- Claim
- Data
- Warrant
- Inductive Reasoning
- Deductive Reasoning
- Jousting
- Neo-Impressionism
- Pointillism

French Vocabulary

- Place des Lices (Place of the jousting ground)
- St. Tropez (location in France)
- Provençal Market (provincial market—there is one twice a week in Place des Lices)
- Boules (a French version of the game of bocce)
- Pétanque (the specific type of boules game where a player tries to get his ball closest to a target)
- Paul Signac (painter)

Color Names

- Rouge (Red)
- Bleu (Blue)
- Vert (Green)
- Jaune (Yellow)
- Noir (Black)
- Blanc (White)

Artworks



Paul Signac, <u>Place des Lices, St.</u> <u>Tropez</u>, 1893, Acquired through the generosity of the Sarah Mellon Scaife Family, 66.24.2



Claude Monet, <u>Waterloo Bridge,</u> <u>London</u>, 1903, Acquired through the generosity of the Sarah Mellon Scaife Family, 67.2

Phase 1—Art-making, Teamwork, Warm-up

1. Provide each student with one black-and-white piece of the larger painting (see below). The sample here is divided into 32 different parts, one for each of 32 students, but if you have more, the total image is also available for you to cut as you see fit.

2. Provide colored markers and ask students to "color" on the pieces of the painting by using dots only. Give them only basic colors so they have to "combine" them to make the right shades. Model this if needed.

3. Hand them the artist's version (color section of the painting that corresponds to the black-andwhite one they just colored) and have them look at and think about the differences. Ask for a few volunteers to share their findings and wonderings. What do they think their painting's subject is?

4. Optional: teach students the French words for the colors they are using. See vocabulary chart above. Encourage students to use the French words, as the artist would have, when they discuss the painting. **5.** Have students sign their colored versions in what they think is the bottom right corner of their artwork.

Phase 2—Examining the Artwork

1. Show students a portion of *Place des Lices, St. Tropez* zoomed in (pictured below). Here I have focused on what we know is a person's shoulder and part of the bench upon which he sits.



2. Ask students what they see in this painting. Ask them what they think is the subject or purpose of the painting. Encourage them to see the individual "dots" of color. If you so choose, ask them to identify these colors by their French terms. They aren't really supposed to know what they're looking at yet, but the goal is to get them to identify that this painting is made up of multiple individual specks of paint.

3. Tell the students that the title of the painting is *Place des Lices*,

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St. Tropez by French painter Paul Signac. Define those title words for them in French (place of the jousting ground) and encourage them to repeat the pronunciations back to you. When they answer further questions, encourage them to use the title and/or artist and the correct pronunciations. Depending on the backgrounds of your students, you might also need to define what "jousting" was—a medieval sport in which competitors rode on horseback and used blunt spears to hit or knock over their opponent completely.

4. Ask students to collaborate as a class to assemble their pieces of artwork on a wall, with the goal of recreating *Place des Lices, St. Tropez*.

5. Zoom out a bit (see right) and ask if the title, artist, or location (St. Tropez, France) help them further identify what they're looking at. Tell them that it is "Neo-Impressionism" and see if that helps them call on any prior knowledge they might have to help them understand. Encourage them to comment on how, as we zoom out, the colored dots begin to meld together to make other shapes and colors. Of course, we know that this painting isn't about jousting per se, but don't discourage students from trying to make sense of what they see with the other information they know.



6. Ask students to comment on why the painter might have chosen these particular color combinations. How might they contribute to how light and shadow? What season might it be? Again, center the use of the French terms if you're choosing to use that part of this lesson. The French words for *light and shadow* would be *lumière et ombre*.

7. Zoom out even further and ask students to take a moment to evaluate how different what they're seeing now (pictured below) is from what they initially viewed. Ask them what a painter might get out of using small dots and images that don't mean much when viewed separately, but when viewed together, can

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clearly form an image. We can't speak directly for this painter, but why would anyone choose a style that is so different close up than it is far away?



8. Zoom out one final time, allowing students to see the entire painting. If you're able to (see extensions and modifications), arrange a visit to the museum to see the work in person so you can encourage them to do this exercise in person–look at the work up close, then again from a distance. The work in its entirety is pictured below.



9. Once again, encourage students to discuss why an artist would make these decisions: why these colors,

why this pointillist format, why this place, why this angle, etc. This is the foundation for understanding rhetorical analysis of printed text. Encourage students to consider not just what the artist has demonstrated literally, but how his choices have impacted the meaning of the work as a whole. How do these shadows allow the artist to set the tone for the piece? Encourage them to move beyond "because they are dark," into more precise analysis, such as "the angles, shadows, and colors suggest the sun is either rising or soon setting, allowing the artist to set a tone either of hope, or closure, depending on how one views it," especially if you're working with AP students.

10. Give the students a bit of information about the history of this piece: it was created in 1893, the location is a real park that was once a jousting ground but is now the home of summer markets and events. Use the French vocabulary of *boules, petanque,* and *provençal market* to teach the students about the origin of this piece, encouraging them to pronounce the words correctly. Explain how some sounds work differently in French than they

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do in English. Also, let them know that French and English syntax are different. In French, for example, it is *Place des Lices*, but in English we'd likely rearrange that to "Jousting Place," rather than "Place of the Jousting."

Phase 3—Transitioning to Rhetorical Analysis

1. Remind students that a rhetorical analysis requires a reader to move beyond what a writer is "saying" and comment on and dissect what they are "doing." It requires a reader to move beyond the meanings of the individual words, and comment on how the words a writer has chosen impact the overall message or argument.

2. Let students know the purpose of this part of the lesson—to identify when a writer is using inductive reasoning vs. when he is using deductive reasoning in an argument. The longer-term goal is to be able to do each of these as writers themselves.

3. Define both inductive and deductive reasoning for the students. Ask which was used in their investigation of the art we looked at earlier. How do we use each of these kinds of reasoning in our daily decision-making?

4. Explore these types of reasoning in academic areas outside of English such as mathematics and science. If you'd like, have the students work through the accompanying worksheet (below) in small groups or with a partner.

5. Define for the students the terms *claim*, *data*, and *warrant* as they apply to written arguments using the basics of the Toulmin method. Using the second artwork for this lesson (*Waterloo Bridge, London* by Claude Monet), ask them to write a claim, include data, and construct a warrant while they explore the painting. You can use their written responses as a jumping-off point for discussion, as an exit ticket to check for understanding, or as a homework assignment to practice this lesson's concepts.

Extension #1: Exploring Preservation

Allow students to investigate either via the internet or through Carnegie Museum of Art directly how this specific painting needs to be preserved. What considerations must be made for lighting and environmental factors? How does the medium of oil on canvas matter in considering how to display and preserve this piece? How do museums use reasoning to determine the best courses of action in preserving precious items?

Extension #2: French Language Exploration

Nove beyond the basic French words and pronunciations needed for discussion of Signac's painting and ask students to research the words for oil on canvas, impressionism, painting, and other art-related terms. Have a brief chat in French (or a hybrid of French and English) in which you try your hands at using these French words instead of the English ones when describing the art.

Explore with your students more about St. Tropez, the customs and celebrations there, and how Place des Lices is used in present-day France. Work with them to say place names and event names properly, focusing on how vowels and accented syllables are used in French.

Extension #3: Rhetorical Analysis

Provide students with a text of your choosing (or choose <u>this</u> or <u>this</u> or <u>this</u>) and ask them to identify the kind of reasoning the writer is using, what his/her main claims are, where the data can be found, and how the writer justifies the link between data and claim in the warrants.

Extension #4: Field Trip

Arrange a field trip to take your students to the Carnegie Museums of Art and Natural History. Either allow the students free time to enjoy the spaces keeping in mind the general ideas from the lesson, reflecting on what judgments or conclusions they can make based on either type of reasoning, or talk with a museum educator about arranging a focused experience for you and your students.

Modification #1:

Provide students with additional examples of Impressionism, Neo-Impressionism, and pointillism to allow them to really see what it is all

Lesson Extensions and Modifications

about before asking them to make comments on Signac's work. Some examples include:

- <u>This video</u> from Carnegie Museum of Art about impressionist Vincent Van Gogh's work
- Monet's Water Lilies (Nymphéas)

• <u>This article</u> from the Met that further explains the movement and includes one of the most famous pointillist images in history

Modification #2:

Omit the second piece of artwork and instead have students work with some accessible texts to write claims, data, and warrants. Some works that might help yield similar results with leveled reading and/or higher interest include:

- Lou Gehrig's Farewell Speech
- From the movie, "Ali," Mohammed Ali's defense of refusing to go to war
- Poet Nikki Giovanni's <u>speech</u> on the Virginia Tech shooting tragedy
- From the movie, "Toy Story 3," Woody's <u>speech</u> to the toys

Modification #3:

Simply use the Signac piece as a warm-up to any close-reading exercise or activity you'd like to do with your ELA students. It can simply be an entry-point to demonstrate to students at any level that in art and in text there is often a difference between the parts and the whole, though those elements are related. You do not need to use this as a pathway to discuss logical reasoning, but can instead use it as a means to demonstrate how details matter.

Reasoning and Logic: How We Solve Problems

Name: _____ Date: _____ Class Period: _

When faced with a problem, question, or wondering, we as people typically don't draw conclusions at random. We think things through.

But, HOW do we do that?

The math, philosophy, and science communities teach us to use logical reasoning.

INDUCTIVE: drawing your conclusions and predicting outcomes based on what you already know going into the situation

DEDUCTIVE: finding clues and then drawing conclusions based on that data collection

In INDUCTIVE reasoning, we make a prediction (hypothesis) and try to prove it is correct, like in a science experiment. In DEDUCTIVE reasoning, we don't have preconceived conclusions drawn, but only draw conclusions once all of the information is available, like detective work.

With a partner or group, answer these questions:

1. Look at this pattern. What would come next? Why? How did you come to this conclusion?



Reasoning and Logic: How We Solve Problems

2. Look at this diagram then consider which, if any, of these statements are true given ONLY the information provided here. Explain your answers.

- A. You cannot make pancakes without sugar.
- B. There is no flour in an omelette.
- C. Eggs are needed to make noodles, pancakes, and omelettes.
- **D.** Batter is used to coat foods for deep-frying.
- E. Flour, eggs, and milk are all ingredients used to make noodles.



3. We know from basic mathematical principles that the sum of any two odd integers is always an even number. Can you write an explanation of how we could possibly know that?



Place des Lices, St. Tropez to print and cut out