



Curriculum Units by Fellows of the National Initiative
2024 Volume I: Landscape, Art, and Ecology

Art of the Mushroom

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Introduction

This unit explores the wide variety of usages of mushrooms in science and art. (1) Students will look closely at mushrooms and through interdisciplinary experiential learning explore how mushrooms connect humans with the world around us. Students will experience artmaking as a process. Using observation and response, they will develop new understanding of mushrooms as dynamic organisms with broad cultural associations that can be useful to humans in unexpected ways.

The main objective of this interdisciplinary visual arts unit is that students will experience how very close observation in visual art can heighten our interest in, and understanding of, the natural world. For example, I looked at the vivid details of “Two Narcissi and a Columbine, a Dragonfly and a Stag Beetle,” a watercolor drawing with charcoal by the French artist Jacques Le Moyne de Morgues. The artist Le Moyne was sent to Florida by King Charles IX as a cartographer in 1564. He is “one of the earliest and most gifted botanical painters in European art.” (2) Seeing this artwork sparked my interest in watercolors like the ones we will discuss. This unit hopes to do the same for students in the art classroom.

Mesoamerican cultures believed mushrooms could provide a lightning bolt of enlightenment. (3) In the ancient world, Egyptians thought that mushrooms were “the magic food” of the Pharaohs. (4) In our current world, the specter of the mushroom cloud is an image which warns of the potential total destruction of humans and our planet. (5) But the mushroom can also help us. There are potential uses of chemicals extracted in the lab from mushrooms for cancer treatment. According to an article in the *International Journal of Molecular Sciences*, tumor growth can potentially be inhibited by chemicals extracted from mushrooms. (6) Mushrooms also offer solutions to land remediation from toxic waste. (7)

Teachers who use this unit will find that it can be applied across disciplines. Mushrooms are a fascinating topic and there are so many ways to incorporate new ideas into this framework. The influential nineteenth-century German scientist Alexander von Humboldt wrote:

Gradually, the observer realizes that these organisms are connected to each other, not linearly, but in a netlike, entangled fabric. (8)

Humboldt also inspired the created of the field of ecology by the artist Ernst Haeckel which describes the interconnected reliance living organisms have on the environment. (9)

The Mushroom Hunters by Langdon describes multiple uses of mushrooms as food sources and how they are valued culturally in different parts of the world. (10) *Mycelium Running : how Mushrooms Can Help Save the World* by Paul Stamets is a wonderful resource for teachers to access deeper understanding of mushrooms before teaching this unit. This text was the inspiration for spore printing of portobello mushrooms in lesson 2. Mushrooms release spores as they mature and how they do this varies by species. (11) Prints of mushroom spore can be used therefore to identify types of mushrooms. (12) The book *Mycelium Running* describes how the spore printing process can be used to identify fungi. (13) Students can learn that portobello mushrooms have been found to be a source of future energy for battery power. (14)The energy plants get from fungi come from mycelium, the network that feeds fungi, such as mushrooms. (15)

Today we are threatened by climate change and are contending with new challenges that make it necessary to be familiar with how we are impacted by the environment. Spores from fungi can “influence the weather by triggering the formation of water droplets that form rain and the ice crystals that form snow, sleet, and hail.” (16)

This visual art unit is centered on the mushroom motif that teachers can use to encourage students to make meaningful and aesthetically dynamic art. It teaches students patience and to appreciate what can be overlooked or underappreciated. (17) An exhibition at Somerset House in London, *Mushrooms: The Art, Design and Future of Fungi*, brought together mushroom-based art by Beatrix Potter, Cy Twombly and John Cage. (18) These artists demonstrate how science can serve as inspiration to artists. They are examples for students of artists that have used many rigorous art-making approaches. (19)

National Fellow Anna Herman, Agriculture, Food & Natural Resources Management suggested numerous innovative ways that mushrooms can be used in teaching. Herman described baking mushrooms into vessels which I consider to be sculptural art. She also explained how mushrooms can be repurposed as sustainably organic building materials or used as riparian buffers to aid in cleaning up land that has been polluted. Her garden school in Philadelphia is educating students and empowering them with offering financial compensation for their work. Students are learning real world lessons by being employed and developing leadership skills as they act as responsible stewards in the garden for students younger than them as role models. Teachers can model how we impact the world and have agency to create positive change in our environment through positive action and enquiry.

Mathinna: A Colonial Parable

A question that teachers can pose to students is how do mushrooms get their names? Classes can discuss the importance of naming in the identification process of fungi. How do cultural expectations shape the names we are given?

In recent times I found that a mushroom (scientific name *Entoloma mathinnae*) was named after Mathinna, an Aboriginal girl born on Flinders Island in 1835. (20) Who was Mathinna? It is a tragic story. During the so-called Black War of the 1830s in Tasmania, a large Australian island then called Van Dieman’s Land, British

settlers and soldiers attempted a genocide of the Aboriginal people. Her father was named Towterer, chief of the Lowreenne people of south-west Tasmania, and her mother Wongerneep. (21) She was adopted by the colonial Governor of Tasmania, Sir John Franklin and his wife Jane. (22) It can be speculated Lady Jane Franklin wanted to adopt Mathinna to be fashionable: the aristocratic tradition in European contexts often included having dwarfs or enslaved people as part of the household. (23) Mathinna and other children suffered terrible abuse, based on an account she gave in 1846. (24) The Franklins left her behind when the couple returned to England with their daughter Eleanor in 1843. She is remembered in the name of the mushroom because it grows in her home territory.

Mushrooms, Health and Climate Change

Knowing what is edible in the environment around us can be a matter of life or death. Food is so readily accessible in modern times that it is easy to forget that knowledge of what is edible has been developed over millions of years by human beings from observation. Mistaken identification of a mushroom can be deadly. Severe poisoning may require organ transplantation or even cause death.

Mushrooms can be identified through spore printmaking. The development of the spore print is comparable to exposing and developing a print in the darkroom process. Students can develop critical thinking skills as they learn about how artists can change images. A stereotype is the idea of one example as being representative of all others. The printmaking process demonstrates how images can change overtime during reproduction through artistic intervention. My lessons will include printmaking processes that can be adapted by art teachers for photography.

Nature is indifferent to us. However, certain organisms like fungi which are 2.2% of the planet's total biomass have evolved to survive. (25) Like mushrooms that adapt to their environments we need to share information to learn how to improvise to survive in our changing climate. (26) Figure 1 illustrates some of the varieties of mushrooms that can be found locally in Connecticut in during the fall season. The pressures of the climate change crisis are forcing us to re-evaluate the present threat that human destruction of the environment since the Industrial Revolution has on our health. There are lifeforms like fungi that have evolved to survive over millions of years that we can learn from. The motif of the mushroom is like a Baroque vanitas symbol that reminds us of the lethality of ignoring our climate change crisis. (27) The most plentiful biomass on our planet consists of microbes. put that in perspective, animals of which humans are included are only 0.47% of the earth's biomass. (28) Molecularly fungi are closer related to animals than plants and have the potential to treat disease. (29) Mushrooms are deeply embedded in the natural environment and fungal networks may convey "info chemicals" to plants. (30) Students can the world that weave science, art and history together in so many unexpected ways with this unit.



Figure 1, Collected Mushrooms, 2023, Photograph, By Kasalina Maliamu Nabakooza.

Beatrix Potter

Beatrix Potter was a British author who lived from 1866 – 1943. (31) Beatrix Potter is usually thought of as being quotidian and familiar. She made the ordinary world of familiar animals like rabbits and squirrels whimsical and fun. However, her eye was incisive and for her time she was on the cutting edge.

As a young girl, Beatrix Potter noticed that the London air was making her sick. (32) Well educated, she read Julius Oscar Brefeld's multivolume work on mycology as a child. (33) Potter grew up in the inner London area South Kensington, which was nicknamed Albertopolis because its many institutions were founded by Prince Albert. She was exposed to ideas and had the opportunity to see collections at museums and art galleries. (34) Now the Victoria and Albert Museum in London manages the largest collection of artworks by Beatrix Potter. (35)

As a child, Scottish naturalist artist Jemima Blackburn influenced Potter who made copies of her studies. (36) Potter was also inspired by the art of the Pre-Raphaelites and landscapes of the British painters John Constable

and Thomas Gainsborough. (37) Her parents began taking her family to the Lake District for vacations when she was a teenager and she made art that reflected the natural environment. “Mushrooms made their way into Potter’s landscape sketches and backgrounds for her tales.” (38)

She bought a microscope in 1892 and made microscopic drawings inspired by this new innovation. (39) Students could be shown examples of Potter’s microscopic drawings such as the one she did of the mushroom *Aleurodiscus amorphous* from December 30, 1896. (40) This topic also can be put in context of writing and illustration created with children in mind as the main audience for the works. She is most famous for her whimsical illustrated children’s story “The Tale of Peter Rabbit,” published in 1901. It is estimated Potter had approximately 92 pets and they feature in her stories. (41) On one occasion Potter remarked at how the stamping of her pet rabbit Peter struck her as “one of the most energetic manifestations of insignificance which has come under my notice.” (42) This instance reminds me of how mushrooms although ubiquitous are often unseen and appear insignificant. Peter Rabbit was first written in epistolary form and then was published to a wide audience. (43) Students could be shown letters Potter wrote to friends and family which contain drawings and be exposed to how these ideas were revised into what would become her best-known works. (44) Potter also created other memorable fictional characters inspired by animals. Potter was fascinated by mushrooms and observed them so accurately that they can still be identified today by mycologists (botanists who specialize in fungi). (45) Figure 2 is a watercolor drawing that I made of a mushroom I saw this fall 2023 on a Connecticut trail that was collected by local mycologists who identified the scientific name for this mushroom as *Geastrum Triplex*.



Figure 2, Geastrum Triplex Mushroom, 2024, Watercolor Pencil, By Kasalina Maliamu Nabakooza.

If we compare Beatrix Potter to Mathinna, we see two girls, both in the British Empire, who had utterly different lives. Beatrix Potter had many opportunities. Mathinna had very few. It is possible, though, that Mathinna was taught within her community about nature and what mushrooms were edible. In comparing the stories of these two historical figures, gender, race, ethnicity, class and geography clearly impacted outcomes. Limitations placed arbitrarily on students based on their perceived difference can and should be pushed back on so they can learn in the most responsive and positive environment possible.

In 1845, Alexander von Humboldt observed that 'Each step that we make in the more intimate knowledge of nature leads us to the entrance of new labyrinths.' (46) Understanding illuminates the similarities and differences between our perspectives on the world as seen through visual art.

Cy Twombly / John Cage

We rely on plants and they rely on fungi, like mushrooms for food. (47) Specimens are crucial to the science of botany. *In the Herbarium: The Hidden World of Collecting and Preserving Plants* by Maura C. Flannery describes how fungi have been more challenging to collect as specimens because of their moisture content. As an alternative to using the herbarium technique collectors have made spore prints instead. (48) Figure 3 below is a spore print I made from a Portobello Mushroom. The gills that identify this type of mushroom can be seen in the print. This scientific technique is one of the ways that mushrooms have been identified that also be applied to art.



Figure 3, Portobello Mushroom, 2024, Spore Print, By Kasalina Maliamu Nabakooza.

The artist Cy Twombly held unusual but important views on the relation of art and science:

A lot of people have no knowledge of plants, trees, botany and things...I knew a poet who was totally ignorant about botany. And I said: you can't be a poet without knowing any botany or plants and things like that: it's impossible, that's the first thing you should know. (49)

Cy Twombly was an Abstract Expressionist American artist who lived from 1928 - 2011. (50) He worked as a painter, draftsman and sculptor and was especially interested in mark making. (51) Twombly gestural artworks are often multilayered in materials and processes. (52)

Cy Twombly's *Natural History Part I*, consists of ten lithographic and mixed-media prints using a collage technique between drawing and photography and contains a mushroom motif. (53). Like Potter, he was inspired by the materials that could be found in Natural History Museums. The song "Women Gathering Mushrooms," recorded by the American musicologist Louis Sarno in the Central African Republic is described as having polyphony in the book *Entangled Life*, by Merlin Sheldrake. (54) Sheldrake compares this musical form to the way in which more than one story can be told. (55) The perspective of juxtaposing voices next to each other through collage can be applied to teaching this visual arts unit in a way that empowers students. (56) A friend of Twombly who shared his interest in mushrooms was John Cage an experimental American composer who lived from 1912 to 1992. (57) Cage collected mushrooms during the Great Depression as a

food source. (58) He educated himself about the identification of mushrooms because he learned that misidentification could result in poisoning. (59) His interest in mushrooms grew alongside his work as a composer. (60) There is an anecdote about Cage on a game show which demonstrates his extensive knowledge of mushroom types:

In the final episode, with 5m lire at stake (the historical equivalent of about \$8,000 or £3,000), he was asked to list the 24 names of the white-spored *Agaricus* as identified in GF Atkinson's *Studies of American Fungi*. He named them all in alphabetical order, prompting sustained applause from the audience. (61)

Cage said: "The more you know them, the less sure you feel about identifying them. Each one is itself." (62) Cage became interested in the dangers of misidentification and it inspired mushroom art that he made. (63) He also drew inspiration from mushrooms with passion and designed a denim portfolio, with poetry and ten prints. (64) Figure 4 is a botanical inspired linocut print with mushrooms and floral designs. It was inspired by the shifting visual perspectives created by the juxtapositions in the *Mushrooms and Flowers* exhibition catalogue and how Cy Twombly and John Cage experimented with the mushroom motif. I used a piece of found text on typewriter paper to create a collage effect with the printed images. Color unifies the artwork but the forms when looked at closely have asymmetry in comparison to each other within the composition.



Figure 4, Print Flowers and Mushrooms with Text, 2024, Linocut Print, By Kasalina Maliamu Nabakooza.

Lesson Plans With Strategies and Objectives

Unit Summary:

This visual arts unit is written for teaching students in grades 3-4 and is focused on realistic depictions in artworks of mushrooms from observation. The lessons within this unit encourage students to innovate with materials. This unit includes experimentation with mixed-materials when making slime or pop-up mushrooms, print making and watercolor painting. Ideally the duration would be 4 weeks long which is equivalent to 8 classes for each group of students to complete the unit. Examples from art that can be used in the lessons are drawn from the exhibition of *Flowers and Mushrooms* curated by Francesca Gavin, drawings of mushrooms by the British Children's book author Beatrix Potter and a series the American artist by Cy Twombly from his series of mushrooms.

Lesson Plan I : What Is A Mushroom?

Summary: The anchor standard of this lesson is engaging students in reflection. As students learn what a mushroom is they will refine their artwork to reflect their understanding. Students will reflect on how artists like Beatrix Potter have used observation to inform their art practice. The essential question is: "What role does experimentation and revision have in creating artwork?"

Procedures

1. Students will pour glue into bowl. Then mix in half a teaspoon of baking soda and add 1 teaspoon of water. Combining these ingredients will make the slime.
2. The objective is that students are able to experiment with new materials and discuss the topic of the unit.
3. After completion student can describe what a mushroom is and relate their knowledge to the experience of making slime.

Evaluation: The learning target is that students will elaborate visual information by adding details in an artwork to enhance emerging meaning. (VA:Cr3.1.3)

Extension: Advanced students can revise artwork in progress on the basis of insights gained through peer discussion. (VA:Cr3.1.4)

Lesson Plan II : Mushroom Prints

Summary: The anchor standard for this lesson is for students to relate the personal experience of direct observation of mushrooms to make art. Students will learn how artists like Beatrix Potter used personal experiences to develop artwork. The essential question is how does our environment shape the art we make?

Procedures

1. Students will be given portobello mushrooms with unexposed gills.
2. Students will cut off the lower portion of the mushroom, exposing the gills.
3. Students will put the mushroom gill-side down on a piece of dark cardstock paper.
4. Students will add a few drops of water to the top of the mushroom cap to encourage the spores to drop.

5. Students will cover the mushroom with an upside-down box, and set it aside somewhere where it won't be disturbed overnight.
6. The objective is that students will observe and discuss the spore-prints
7. After completion of the lesson students will have an experience looking closely at mushrooms to create prints that can inspire future art.

Evaluation: The learning target is that students will develop an artwork based on observations of surroundings. (VA:Cn10.1.3)

Extension: Advanced students can create works of art that reflect community cultural traditions. (VA:Cn10.1.4)

Lesson Plan III : Mushroom and Flower Block Printing

Summary: The anchor standard for this lesson is for students to begin investigating to develop artwork. Students will learn how artists like Cy Twombly and John Cage experimented with forms and materials. The essential question is: "How do artists create through experimentation?"

Procedures

1. Students will make mushroom and flower prints with Styrofoam blocks.
2. Students will be shown a simplified diagram showing the anatomy of mushrooms which includes: the cap flesh, gills and stem. The teacher will then show the students the wide variety of cap and gill features mushrooms may have.
3. Students will discuss similarities and differences they observe between mushrooms and flowers. Students will be shown a selection of age appropriate artworks from the book *Flowers and Mushrooms* by Peter Handke, Matthias Harder, Mila Moschik, Toni Stoos, Tiina Teufel, Peter Weiermair, and Veit Ziegler. This book is an exhibition catalogue that is resource especially for examples of mushrooms in sculpture and photography.
4. Students will choose from templates of mushrooms and flowers and outline them with pencil to make drawings.
5. Students will trace their designs onto Styrofoam with pens.
6. At a printing station student will come to make prints on paper using ink and brayers after a demonstration by the teacher.
7. The objective is that students learn the printmaking process and gain experience making design compositions.
8. After completion students will be able to describe how to make a print and have gained more specific knowledge of the anatomy of mushrooms.

Evaluation: The learning target is that students will create personally satisfying artwork using a variety of artistic processes and materials. (VA:Cr2.1.3)

Extension: Advanced students can experiment and develop skills in multiple art-making techniques and approaches through practice. (VA:Cr2.1.4)

Lesson Plan IV: Pop-Up Watercolor Mushrooms

Summary: The anchor standard for this lesson is organization of ideas. Students will develop their ideas and learn how artists use to design. The essential question is: Essential Question - " How do artists design objects,

places, or systems?"

Procedures

1. Students will observe the watercolors of Beatrix Potter of mushrooms and describe what they see. Students will choose 1-3 mushrooms from the templates used from the printmaking lesson to and trace them onto watercolor paper.
2. Students will paint their mushrooms with watercolor paper.
3. Students will look at the example of a watercolor pop-up .
4. The objective is that students will make cards that when opened have the mushrooms pop-up.
5. Students will relate their experiences learning about mushrooms in the unit to create compositions. They will reflect on the mushroom artworks of Beatrix Potter, Cy Twombly and John Cage to explore design.

Evaluation: The learning target is that students will individually or collaboratively construct representations, diagrams, or maps of place that are part of everyday life. (VA:Cr2.3.3)

Extension: Advanced students can document, describe, and represent constructed environments. (VA:Cr.2.3.4)



Figure 5, Artist's Conk Mushroom, 2023, Photograph, By Kasalina Maliamu Nabakooza.

Conclusion

Last year in my first year of teaching, during a leaf rubbing lesson, a student asked me if a fall leaf was magic and it became evident that nature has the potential to inspire students to think about how the world works and make art as well. Figure 5 shows how mushrooms themselves can be the canvas for artworks. While I took this photo one of the members of the mycological association in Connecticut I came across explained to me that it is called an Artist's Conk mushroom that can be painted on. The inspiration for centering this unit around the motif of mushrooms came from a hike on a Connecticut trail where a mycological society was having a collection and identification event. This theme can connect to the seminar topic of ecocriticism in the image of the mushroom cloud at the end of the unit. Other ways students can engage with the theme in discussion is through discussion of sustainable food using plant materials for example to replace beef which contributes significantly to pollution. Mushrooms themselves may break down pollutants in the environment. (65) Students can learn about cycles of decay, sustainability and exponential growth through learning about mushrooms through art.

Experimentation should be encouraged. Failure is not final and the growth of the mushrooms can be an example of how success is not always linear. Success depends on our environment and can be promoted through making sure the right resources are available for students to use and appropriate in their creation of art. An idea that she gave me was to provide students the opportunity to grow edible oyster mushrooms within the classroom. This experience would teach patience and encourage a sense of wonder that challenges preconceptions of mushrooms. (66) Students will record reflections by creating art. How will students know when the mushrooms have stopped growing? This is a question that can be presented to students. Ultimately growth of a mushroom or understanding within a student of topic depends on the time and energy put into development from themselves and their instructor. Harvesting the mushroom can also be a wonderful learning experience where students reap the reward for the time and effort they put in the classroom. This is a valuable lesson that can help them with preparing for test taking situations or sticking with difficulty in the learning process.

I want to acknowledge Anna Herman (Science Teacher) who shared many ideas including the *mycelium bear*, from the *Grow.bio* company which she uses to make biodegradable sculptures and packaging. Private companies and governments have been exploring innovative ways to repurpose mushrooms for construction and design. (67) I learned about spore printing from talking with her as well and will be using that as one of the lessons in this unit based on the process described by the North American Mycological Association. Her teaching ethos is captured in the mentality of lifting others in the same way that we would all like to be.

The Yale National Fellowship program is an energizing learning experience from which I have developed the *Art of the Mushroom*, visual arts unit for students in grades 3 - 4. This unit was informed by research done as a Yale National Fellow in the *Landscape, Art and Ecology*, seminar led by the Paul Mellon Professor in the History of Art, Tim Barringer. I want to acknowledge the educators teaching grades K-12 from around the country that I met at YNTI. National fellows such as Alima Saffeel McKnight (Third-Grade Teacher) and Melissa Muntz (History Teacher) have also offered meaningful suggestions during multiple conversations during seminars that have strengthened this unit that combines art, science and history.

Reading List for Teachers

Bilclough, Annemarie, Richard Fortey, Sara Glenn, Emma Laws, Liz Hunter MacFarlane, James Rebanks, Lucy Shaw, and Beatrix Potter. *Beatrix Potter: Drawn to Nature*. London: V&A Publishing, 2021. This is an invaluable resource for understanding how and why Beatrix Potter became an author and illustrator interested in mushrooms and the natural world.

Jackson, P., & Forrester, P. (1993). *The Pop-Up Book: Step-by-Step Instructions for Creating Over 100 Original Paper Projects*. New York: Henry Holt and Co. This book had numerous examples of the possible pop-up projects teachers can use with their students for lesson 4.

Walls, Alissa A. "Cy Twombly and the Art of Hunting Mushrooms." *American Art* 28, no. 2 (2014): 50-69. This essay explains how Cy Twombly was inspired by Mushrooms and his connection to the artist composer John Cage who was his colleague.

Reading List for Students

Laessøe, Thomas., and Gary Lincoff. *Mushrooms*. 1st American ed. New York: DK Pub., 1998. This is an extensive visual catalogue of mushroom specimens with color photographs and information about them.

Gaya, Ester and Katie Scott. *Fungarium: Welcome to the Museum*. Templar Publishing, 2021. This is fantastic resource for students to learn all about mushrooms with detailed illustrated images accompanied by text.

Materials for Classroom Use

Lesson 1

Glue

Baking Soda

Contact Lens Solution

Bowls

Mixing Spoons

Lesson 2

Portobello Mushrooms

Plastic Knife

Cardstock Paper

Water

Lesson 3

Styrofoam

Pencils

Pens

Printing Ink

Brayers

Cardstock Paper

Lesson 4

Pencils

Class Watercolor Sets

Watercolor Brush

Pens

Watercolor Paper

Templates Printed on Cardstock Paper

Erasers

Notes

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 8. Sheldrake, Merlin. *Entangled Life: How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures* (New York: Random House Trade Paperbacks, 2021) 149.
 9. Sheldrake, *Entangled*, 71
 10. Ibid, 101.
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 12. Stamets, *Mycelium Running*, 129.
 13. Ibid, 130.
 14. Sheldrake, *Entangled*, 192.
 15. Ibid, 47.
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 32. Bilclough, *Drawn to Nature*, 23.
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59. Sean O'Hagan, *Brush with Mortality*, 1-3.
60. Ibid, 2.
61. Ibid, 2-3.
62. Walls, "Cy Twombly," 51.
63. Ibid, 51.
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Bluemel, Nancy., and Rhonda Lynette Harris Taylor. *Pop-up Books: A Guide for Teachers and*

Librarians. Santa Barbara, Calif.: Libraries Unlimited, 2012. There is a wide range of potential designs possible for pop-ups. Teachers can accommodate students based on their needs using this guide of techniques and pop-up examples as a reference point.

Breedlove, Byron. "Beatrix Potter, Author, Naturalist, Mycologist." *Emerging Infectious Diseases* 25, no. 9 (2019): 1786+. *Gale In Context: Opposing Viewpoints* (accessed May 8, 2024). <http://dx.doi.org.yale.idm.oclc.org/10.3201/eid2509.181142>. This journal essay begins with an explanation of how mushrooms found their way into Baroque artworks and connects it to Beatrix Potter's closely observed mushroom artworks.

Britannica, T. Editors of Encyclopedia. "Beatrix Potter." *Encyclopedia Britannica*, July 24, 2024. <https://www.britannica.com/biography/Beatrix-Potter>. (accessed July 30, 2024). This is an overview of the life of the British children's author and illustrator Beatrix Potter.

Britannica, T. Editors of Encyclopedia. "John Cage." *Encyclopedia Britannica*, August 8, 2024. <https://www.britannica.com/biography/John-Cage>. (accessed August 9, 2024). This is an overview of the life of the American Composer John Cage.

Cage, John, Kingston Trinder, Ananda Pellerin, Lois Long, and Alexander H Smith. *A Mycological Foray: Variations on Mushrooms*. 2 vols. Los Angeles: Atelier Éditions, 2020.

Christie's, *Old Master and British Drawings*. Christies: New York, 2019. Exhibition Catalogue.

Cook, Langdon. *The Mushroom Hunters: On the Trail of an Underground America*. First edition. New York: Ballantine Books, 2013. This book provides teachers with an understanding of mushrooms as food and the dangers of misidentification.

Flannery, Maura C. *In the Herbarium: The Hidden World of Collecting and Preserving Plants*. Yale University Press, 2023. This book is a profound resource for understanding how and why the study of botany began.

Foster, Kristina. 2020. "Mushrooms at Somerset House Opens the Spores of Perception." *FT.Com* (Feb 28). <https://www.proquest.com/trade-journals/mushrooms-at-somerset-house-opens-spores/docview/2367437154/se-2>. This essay describes a recent exhibition that brings together the mushroom artwork inspiration of Potter, Twombly and Cage.

Ghosh, Iman. "All the Biomass on Earth." 2021, accessed July 15, 2024. <https://nautil.us/all-the-biomass-on-earth-238368/>. I saw the image of the biomass of the earth during the seminar talk given to fellows by Professor Paul Turner and learned that fungi can be considered microbes and have greater mass on earth than all animals, including humans combined.

Handke, Peter, Matthias Harder, Mila Moschik, Toni Stooss, Tina Teufel, Peter Weiermair, and Veit Ziegelmaier. *Flowers & Mushrooms*. München: Hirmer, 2013. This book is a catalogue of an exhibition. It has plentiful examples of artworks of mushrooms in different visual artforms forms teacher reference.

Jackson, P., & Forrester, P. (1993). *The Pop-Up Book: Step-by-Step Instructions for Creating Over 100 Original Paper Projects*. New York: Henry Holt and Co. This book had numerous examples of the possible pop-up projects teachers can use with their students for lesson 4.

Laessøe, Thomas., and Gary Lincoff. *Mushrooms*. 1st American ed. New York: DK Pub., 1998. This is an

extensive visual catalogue of mushroom specimens with color photographs and information about them.

Lubowski-Jahn, Alicia. "Alexander von Humboldt: The Aesthetic Science of Landscape Pictures." In *Cartographic Expeditions and Visual Culture in the Nineteenth-Century Americas*, pp. 17-34. Routledge, 2020. This was a text given to our seminar, that was read and analyzed together in class presentation on 5/3/2024. Humboldt's book *Cosmos* about the changing environment in the Andes mountains inspired the landscape paintings of Thomas Cole who mentored Frederic Church. During the intensive we visited Olana the home of Church in the Hudson River Valley and the home of Thomas Cole. This trip gave me a deeper understanding of how stunning viewscapes of the Catskill mountains and the Hudson River Valley inspired them from their homes and studios.

Lum, Julia. 2018. "Fire-Stick Picturesque: Landscape Art and Early Colonial Tasmania." *British Art Studies* (10). This was a seminar reading for the National Fellowship. Discussion of this topic in seminar led to my learning the story of Mathinna and the mushroom named after her.

O'Hagan, Sean. 2020. *A Mushroom-Related Brush with Mortality: How John Cage Fell for Fungi*. London (UK): Guardian News & Media Limited.
<https://www.proquest.com/blogs-podcasts-websites/mushroom-related-brush-with-mortality-how-john/docview/2435339737/se-2>. This text explains the unexpected inspiration John Cage drew from mycology.

Rogers, Hannah Star. *Art, Science, and the Politics of Knowledge*. MIT Press, 2022. This is a book about dynamic intersections between the fields of art and science.

Schofield, Leo. 2008. "Mathinna Lessons Resonate." *The Mercury*, Nov 08. <https://www.proquest.com/newspapers/mathinna-lessons-resonate/docview/352935584/se-2>. This article describes how Mathinna was adopted by the Franklins and a perspective on her life story's impact today.

Sheldrake, Merlin. *Entangled Life: How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures*. Random House Trade Paperbacks, 2021. This book has a plethora of information about how integral fungi are to our world and the potential uses they contain.

Stamets, Paul. *Mycelium Running: How Mushrooms Can Help Save The World*. Berkeley: Ten Speed Press, 2005. This is a scientific book that can help give teachers greater understanding of mushroom qualities and uses.

Tsing, Anna Lowenhaupt. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press, 2015. This book has a more cultural references about mushrooms for a global perspective in teaching the subject. It also can give teachers context for understanding how the topic can be related to economics and climate.

Venturella, Giuseppe, Valeria Ferraro, Fortunato Cirlincione, and Maria Letizia Gargano. 2021. "Medicinal Mushrooms: Bioactive Compounds, Use, and Clinical Trials" *International Journal of Molecular Sciences* 22, no. 2: 634. <https://doi.org/10.3390/ijms22020634>. This is a scientific review of the potential uses of mushrooms in cancer treatment.

Wainwright, L. S. "Cy Twombly." *Encyclopedia Britannica*, July 1, 2024. <https://www.britannica.com/biography/Cy-Twombly>. (accessed July 5, 2024). This is an overview of the life of

the American artist Cy Twombly.

Walls, Alissa A. "Cy Twombly and the Art of Hunting Mushrooms." *American Art* 28, no. 2 (2014): 50-69. This essay explains how Cy Twombly was inspired by Mushrooms and his connection to the artist composer John Cage who was his colleague.

Wasson, R. Gordon. *The Wondrous Mushroom: Mycolatry in Mesoamerica*. New York: McGraw-Hill, 1980. This is an anthropological text about cultural practices in Mesoamerica with mushrooms.

Appendix on Implementing District Standards

This visual art unit meaningfully implements the school district's academic standards because students will learn to think critically about their observation. Students will implement their understanding of the topic of "Art of the Mushroom," within this unit through demonstrating creative expression with artwork made from a wide range of materials. This interdisciplinary study of mushrooms bridges art, science and history and promotes visual literacy. Using learning progressions students will acquire a conceptual framework for thinking about their relationship to the environment around them.

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