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2024
2025

Ideas with IMPACT

STEAM

Fungi Friends & Mycelium Networks

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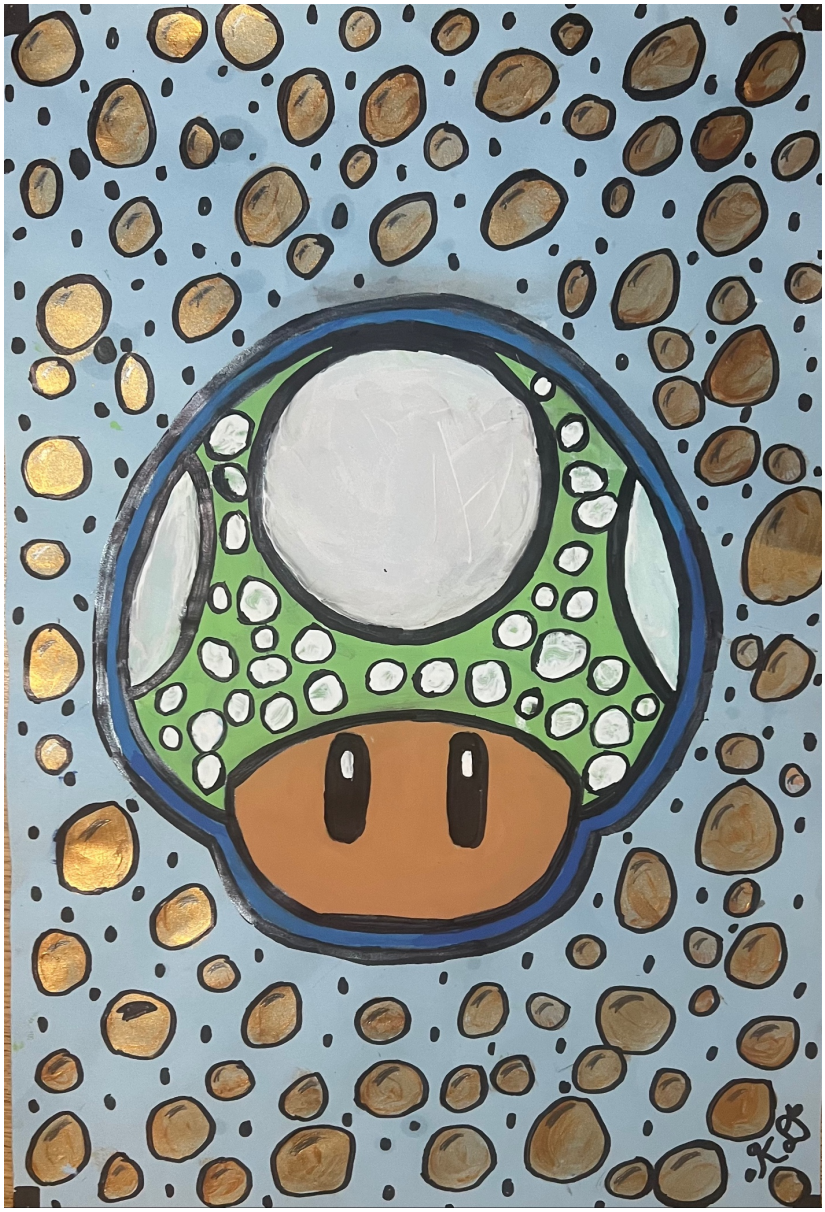
School District Education Foundation Matching Grant Program

Fungi Friends & Mycelium Networks:
A STEAM Unit on Growing Creative Community through Study of Mushrooms



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School Location Number: 13-6018

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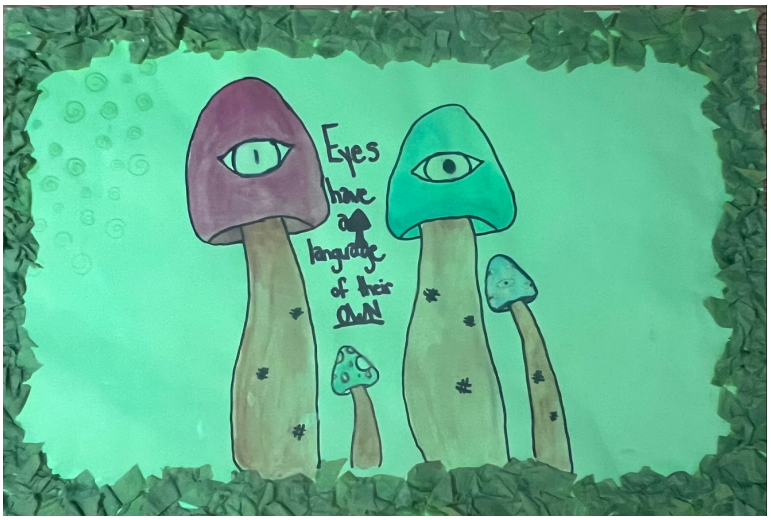
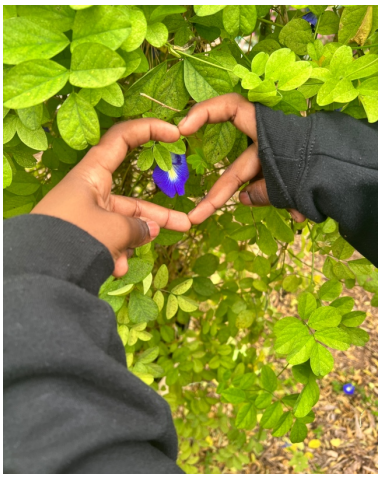




GOALS AND OBJECTIVES

Fungi Friends & Mycelium Networks:

A STEAM Unit on Growing Creative Community through Study of Mushrooms

The future is mycology! This workshop will explore how to effectively craft innovative, hands-on STEAM projects to help K-12 educators excite and engage students (even reluctant ones!) in the study of the Fungi Kingdom.

This project is a STEAM-centered unit on mycology, which seeks to expose students to the wonderfully intriguing Fungi Kingdom. Through a variety of creative lessons encompassing **Life Science**, "**Gardening & Resilience**" (SEED Miami high school Elective course founded by Ms. Andi Potamkin) and **Visual Arts & Culture** projects, students will engage in a scientific and imagination-rich set of activities, designed to both activate and enhance their curiosity and knowledge of a variety of mushrooms and their natural environments. In the process of studying mycelium networks, we see in nature the **interconnectedness of all things**, and in turn we create **community** in our creative Studio Spaces.

Some goals and objectives of this workshop are:

- Educators will be given creative tools for ways to differentiate **Fungi Friends & Mycelium Networks** via a number of STEAM projects, focusing mainly on Life Science and Visual Arts.

- Educators will be given connections on how to imaginatively transform educational spaces (on a budget!), with innovative examples of how to make the "environment the third teacher" in ways authentic to personal teaching styles/aesthetics.

- Educators will be shown how to effectively craft STEAM projects that engage and excite students (even the resistant ones) about studying mushrooms and their growth processes.

- Educators will be given resourceful ways to use items currently on hand to create more sophisticated arts projects, as well as how to experiment with nontraditional tools in crafting artwork.

- Educators will see how using a streamlined rubric—"the 4Cs of Visual Arts & Culture"—can simplify and enhance the grading process (especially for Project-Based Learning **process and product**), and grow community within your class sessions.

FLORIDA STATE STANDARDS

(The standards below are for my current students in middle school, but they can certainly be adapted down to elementary as well as up to high school levels, as well as to other content areas as per your needs).

VISUAL ARTS STANDARDS

Big Idea 1: Critical Thinking and Reflection

VA.68.C.2.1: Assess personal artwork during production to determine areas of success.

VA.68.C.2.3: Examine artworks to form ideas and criteria by which to judge/assess and inspire personal works and artistic growth.

VA.68.C.3.1: Incorporate accurate art vocabulary during the analysis process to describe the structural elements of arts and organizational principles of design.

Big Idea 2: Historical and Global Connections

VA.68.H.1.4: Explain the significance of personal artwork, noting the connections between the creative process, the artists, and the artist's own history. (Takashi Murakami)

Big Idea 5: Skills, Techniques, and Processes

VA.68.S.2.3: Use visual-thinking and problem-solving skills in a sketchbook or journal to identify, practice, develop ideas, and resolve challenges in the creative process.

VA.68.S.3.2: Develop spontaneity and visual unity in artwork through repeated practice and refined craftsmanship.

SCIENCE STANDARDS (GRADE 7)

SC.7.L.17.1: Explain and illustrate the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web. (Life Science)

COURSE OUTLINE/OVERVIEW

In **Fungi Friends & Mycelium Networks: A STEAM Unit on Growing Creative Community through Study of Mushrooms,** scholar-artists will be able to:

- study and sketch various types of mushrooms (mushroom anatomy and function), through a number of creative activities utilizing Life Science and Visual Arts & Culture

- study the life and artwork of Takashi Murakami, and find inspiration in his "Alter Ego" series to create "Mushroom Self-Portrait Alter Egos" in a variety of art media (2D & 3D)

- use scientific diagrams and illustrations of various mushrooms to create imaginative interpretations of these fungi for a community art installation

- be involved in the foundational structural and creative process to create a mycelium network—"Earth's natural internet"— effectively utilizing "the environment as the third teacher"

- be involved in gardening and culinary hands-on experience sessions that dedicate time and space to growing, cooking, and learning medicinal and other wellness-based facts about the Fungi Kingdom

Interest and intrigue in the field and study of mycology by a widening segment of the population makes this project one that will be enjoyed by students of myriad ages, grades, abilities, and interests. Whether through research, consumption/culinary use, and/or multiple-body system health and wellness reasons, the study of mushrooms in a variety of modalities is on the rise. This STEAM unit, entitled **Fungi Friends & Mycelium Networks: A STEAM Unit on Growing Creative Community through Study of Mushrooms**, will take students on a scientific and artistic creative study of the Fungi Kingdom. Students will have an opportunity to sketch, sculpt, design, and build mushrooms in various contexts, as well as to create an entire artistic replica of a mycelium network, illustrating the "environment as the third teacher." Students will also have an opportunity to grow their own mushrooms, and to use a school garden setting as an inspiration for culinary and art projects connected to fungi, as well as other living things in the garden ecosystem. Overall, an interdisciplinary, differentiated and highly hands-on set of activities for individuals, pairs, and teamwork to grow community at all levels is here!

LESSON PLANS & GUIDE TO IMPLEMENTATION

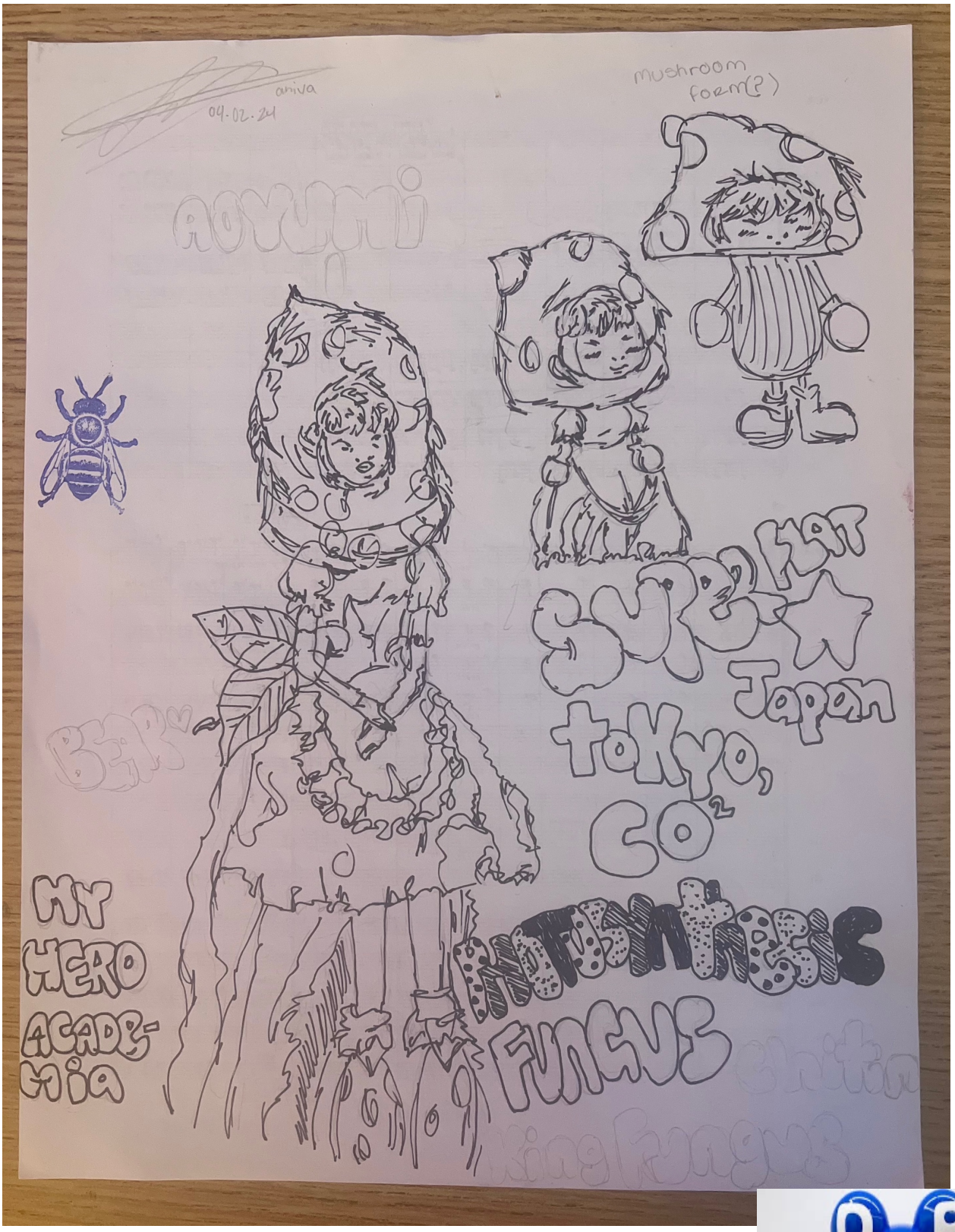
Some examples of cross-curricular STEAM, community-building activities that students will engage in throughout this unit include:

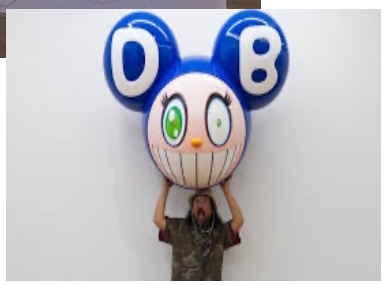
- **Introduction to Mushroom Anatomy and Varieties**
- **Takashi Murakami and Self-Portrait "Alter Ego" Mushrooms**
- **Eat What You Grow: Culinary and Nutritional Value of Mushrooms**
- **Community Art Installation: The Mycelium Network**

- **Introduction to Mushroom Anatomy and Varieties**

Utilizing **The Deck of Mushrooms: An Illustrated Guide to Fantastic Fungi** by Dr. Sapphire McMullan-Fisher, students are introduced to 50 of the hidden kingdom's most interesting mushrooms. On each of the illustrated cards, students learn about a fungi's habitats, uses, and history. Students are directed to pick a card(s) of their choosing to begin mushroom research, but then will put it aside for a moment in order to first begin exploration of mushroom anatomy. Students will create a labeled sketch (using class **Sketch Journal)** of the general anatomy of a mushroom, using such vocabulary as: **margin**, **gills**, **spores**, **cap**, **ring**, **stem**, **sack**, and **mycelium**.

After students complete their labeled anatomy sketch, they return to their chosen mushroom card to create various practice **thumbnail sketches**. We used these practice sketches as inspiration for our **Collective Mushroom Wood Assemblage** project, which was created with mainly donated, found, repurposed, and thrift store items. Adapt and differentiate as works for you!


aniva
04.02.24
mushroom form(?)
AOYUMI
BEAR
SUPERHAT
Japan
tokyo,
CO^2
MY HERO ACADEMIA
photosynthesis
FUNGUS
Shiitake
King Fungus

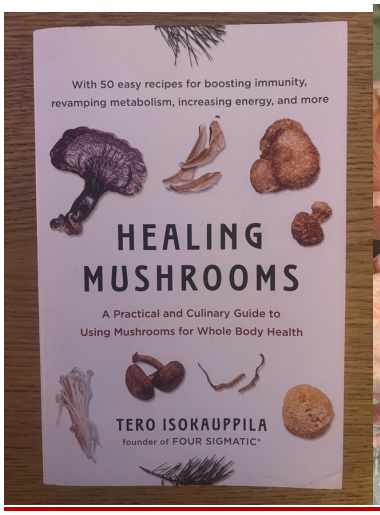


"Mushroom DOB", 2008

- **Takashi Murakami and Self-Portrait "Alter Ego" Mushrooms**

Students explore a series of slideshows, videos and other imagery exploring the life and work of internationally acclaimed artist **Takashi Murakami**. Students learn about Murakami's **Superflat** style, his influence from anime, and his various **alter ego** characters, including "Mr. DOB" and "Mushroom DOB." Using the research and discussion on Murakami as inspiration, students create their own **Self-Portrait Alter Ago Mushroom** art. These 3D pieces then come together in

community from all the classes that have engaged in this unit in our last explored project in this unit, the **Community Art Installation: Mycelium Network**. Mushrooms were constructed from wood, paper, clay, found objects, etc. One student had the idea that each self-portrait character could have a transformed paint palette as their "home." Students built out from the palettes to create a more detailed experience for display in our classroom **Arts Studio 154/The Enchanted Forest**.



- **Eat What You Grow: Culinary and Nutritional Value of Mushrooms**
  We are very fortunate at our school to work with a wealth of amazing Individuals and organizations in our **Gardening & Resilience** program. Our founder and primary funder (and my beautiful **co-educator/creator**) **Ms. Andi Potamkin** has been central to what it takes to make such a networked undertaking possible. We remind ourselves that the networks of community we create in this program connect and co-exist with the great mycelium networks under the earth we tread. **Ms. Muriel Olivares** and **Ms. Nonnel Galaviz-Johnson**—**along with the rest of the wonderful crew**—have been our spirit partners in **Little River Cooperative** (**@littlerivercooperative**), where their culinary plant nursery programming helped us learn how to cultivate our edible gardens through their varied hands-on workshops. Our elder chef and guide **Chef Raffie** (**@chefraffie**) provided us with wonderful and varied recipes from many cultures and traditions (using our garden ingredients as much as possible), and also taught us how essential

leadership skills, listening skills, and personal accountability are to a well-run kitchen.

Students had an opportunity to grow their own edible culinary mushrooms in our programming this year through two main entities: **North Spore (https://northspore.com)** and **Mistercap's Mushrooms** (**https://mistercaps.com**). Both of these companies offer affordable grow kits that help students to learn about the nutrition and wellness benefits of commonly utilized culinary mushrooms, such as: **Oyster**, **Shiitake**, **Lion's Mane**, and **Reishi**. Both sites offer free educational resources, as well as educational phone and Zoom consultations to help guide your group to meet the needs of your programming details.

- **Community Art Installation: Mycelium Network**

At the end of our collective unit, students took their respective **Alter Ego Self-Portrait** sculptures, and worked collectively to create our own community **Mycelium Network.** Though still in process, the community built around working together for a common goal and a unified piece of work is real and lasting for student-artists. Adaptation, flexibility of thought, critical thinking and problem solving, innovation, and creativity are just some of the benefits of this type of project-based learning. Members of the class community have autonomy over the choices they make in creating their own work, but have the opportunity to also come together and see how their work is essential to creating the whole. All ideas are heard, and all voices are considered. The more students experience this type of learning experience, the more they will grow into self-determined, conscientious individuals and community members, wherever their journey leads them.

ASSESSMENT:

The 4Cs of Visual Arts assessment—**CRAFTSMANSHIP, COMPOSITION, COMMUNICATION, CREATIVITY**—explained below and indicated on grading rubric provide the key touchstones that students use throughout the year as a consistent grading model. These 4Cs help guide students to create assigned projects that are well-thought out and executed with care for detail. Additionally, **Artist Statements** are required for this project, wherein students have an opportunity to explain their project in a written format complementing the visual image. Please see Rubric options at the end of this document, which can be used for Self, Peer and Teacher Critiques, all of which are experientially important for our students.

THE 4Cs OF VISUAL ARTS ASSESSMENT

- **CRAFTSMANSHIP-** Did I develop my artistic skill with the art tools and materials provided?
- **COMPOSITION**- Did I intentionally organize Art Elements to create a unified design?
- **COMMUNICATION**- Did I apply art knowledge and skill to express, identify, and evaluate my ideas in visual, written, and oral presentation formats?
- **CREATIVITY**- Did I face challenges and express my ideas in unique and personal ways?

RESOURCE LIST

CLASSROOM MATERIALS & SETUP

Any classroom space, whether physical, distance, or a blended learning model, can successfully implement the ideas and projects contained within this presentation. Additionally, many of these projects lend themselves to an interdisciplinary model of learning, specifically STEAM in this case. A projector or SMART board is helpful for class discussion, and interactive PowerPoints bring life to a distance learning model in various genres that provide reference points for student work. Technology that students' potentially have access at home, such as laptops, iPads, and cell phone cameras provide some opportunities for photography/mixed media work. A variety of art supplies & curriculum materials that can be adapted to the instructor's needs and desired outcomes were also used throughout the course of this project. These assorted art supplies and materials include, but certainly are not limited to:

- **The Deck of Mushrooms: An Illustrated Introduction to Fascinating Fungi** by Dr. Sapphire McMullan-Fisher (set of 53 illustrated educational cards)

- **Healing Mushrooms: A Practical and Culinary Guide to Using Mushrooms for Whole Body Health** by Tero Isokauppila

- **Fantastic Fungi** documentary film and accompanying book (you may wish to be selective about the sections on plant medicine, and instead use sections of the film in connection with your lesson plan. There is some amazing stop-motion video footage that will engage your students' interest in the topic!

- Art supplies, such as various types of art paper; paints; fabric, ribbons, and other notions; beads, wire, scissors, glues, and other sculptural materials; wooden mushrooms (also can be made from clay, cardboard, paper, etc.); wooden pieces; moss; "googly" eyes, etc.

- Repurposed, recycled objects, such as: various sizes of cardboard and other packaging materials: various items found at thrift stores and/or donated by community members—When in doubt, you what you have!

RESOURCES

- Use of school media center and/or laptop stations with projector for internet research and projecting designs

- Repurposed items contributed by community members

- Use of a school garden, kitchen, and arts space where possible

- Consider potential guest speakers in person or on Zoom
  -**Magic City Fungi** www.magiccityfungi.com (A local family-owned business specializing in health and wellness mushroom tinctures)
  -See the lesson plan section for companies to order mushroom kits

Visual Arts & Culture Project Rubric

Rubric Components	Point Scale				Commentary
	4	**3**	**2**	**1**	**Peer/Self-Critique**
CRAFTSMANSHIP Did I develop my artistic skill with the art tools and materials provided?					
COMPOSITION Did I intentionally organize Visual Art Elements to create a unified design?					
COMMUNICATION Did I apply art knowledge and skill to express my ideas in visual, written, and oral presentation formats? Was I a leader?					
CREATIVITY Did I face challenges and express my ideas in unique and personal ways?					

ADDITIONAL NOTES					

the art of education

Studio Habits of Mind Student Self-Reflection Rubric

Studio Habit	4	3	2	1
Develop Craft	The materials and tools I used were chosen intentionally and applied with care. I skillfully incorporated new techniques as well as made connections to my previously made artwork/experiences.	The materials and tools I used were chosen carefully. I applied new techniques as well made connections to other artwork/experiences.	I put some thought (with teacher help) into the choosing of the materials/tools. I attempted new techniques and tried to make connections to other artwork/experiences.	I put little to no thought (even with teacher help) into the choosing of the materials/tools. I did not try new techniques and there are no connections to other artwork/experiences.
Engage & Persist	I challenged myself to embrace my art making problems and developed a distinct focus within my work.	I challenged myself to not let my art making problems hinder my work too much; I developed a focus within my work.	I let my art making problems influence my work and my focus lost clarity because of it.	I let my art making problems take over my artwork and my artwork lost focus as a result.
Envision	I imagined and practiced many ideas/processes before and during my art making.	I considered and tried out a few ideas before and during my art making.	I started and continued my artwork with little envisioning or practice.	I started and continued my work with no consideration of how it might turn out.
Express	My work clearly conveys an idea, mood, or place that expresses some part of me. My work shows an awareness of other viewers.	My work communicates an idea, mood or place. My work somewhat shows an awareness of other viewers.	My work somewhat communicates an idea. There is little awareness of other viewers.	It is not clear what my work is communicating or how it reflects me. There is no awareness of other viewers.
Observe	I spent an extensive amount of time observing my subject matter, art making processes and /or the environment around me that I may have otherwise missed.	I spent time observing my subject matter, art making processes and/or the environment around me that I may have otherwise missed.	I spent limited time observing my subject matter, art making processes and/or the environment around me.	I spent no time observing my subject matter, art making processes and/or the environment around me.
Stretch & Explore	I took risks in my art making and learned from my mistakes. I taught my peers with new ways of art making.	I challenged myself to explore a new idea or try out a new media but I still "played it safe".	I experimented with a new idea or media but my finished work reflects what I always do.	I stayed with what I am familiar with and/or reproduced someone else's work or ideas.
Understand the Art World	I spent time discovering aspects of artwork from other artists that I may have missed before.	I spent some time discovering aspects of artwork from other artists.	I spent just a small amount of time examining others' artwork.	I ignored any and all others' artwork.
Reflect	I am very conscious of my art making process and my honest self-evaluations reflect that.	I am aware of my art making processes and my self-evaluations reflect that.	I am becoming more aware of my art making processes and my self-evaluations are starting to reflect that.	I am unaware of my art making process and/or I have no self-evaluations of my work.

Leadership Skills
FOSTERED THROUGH ART

Collaboration

Communication

Creativity

Problem-Solving

Commitment/Perseverance

Responsiblity

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