

Note: Before you plan and write art experiences; pre-assess your students based on the proposed concepts, enduring understandings, and objectives of the unit/lesson(s). You may also gather this information from (previous) teachers, by reviewing already completed art work, consulting curriculum materials, etc., to get a better understanding of what content students already know and what they will need to know to be successful.

Pre-Assessment:
This will need to be done prior to teaching your lesson. Outline the method you will use to determine the skill/knowledge level of your students based on the concepts/enduring understandings/objectives of the lesson. (Hint: turn these into questions.) Be specific in describing what you would recognize as proficient skill/knowledge.

Questioning:
Are art and science similar?
Can science be artistic?
Who knows what this image is of?
Appendix 1

Performance:
What will students accomplish as a result of this lesson? This can be presented to students in the form of a story. In this narrative the students take on a role and create a learning product about a specific topic for a certain audience. (RAFT – Role / Audience / Format / Topic)

After watching the video on how an artist and a scientist collaborated to create artwork with cancer cells you will all be taking the part of the scientist and the artist. We have looked at different cells and what their components. Remember the cell you make must have a Nucleus, Cell Wall, and Cell body. You will be representing yourself by designing your own cell. Think about your favorite colors, patterns, things you enjoy doing. You will be constructing and designing your cell body and wall out of clay and will be making your nucleus by weaving various yarns together

Concepts:

List the **big ideas** students will be introduced to in the lesson. These ideas are universal, timeless and transferrable. Examples of concepts used in art might include: Composition, Patterns, Technique, Rhythm, Paradox, Influence, Style, Force, Culture, Space/Time/Energy, Line, Law/Rules, Value, Expressions, Emotions, Tradition, Symbol, Movement, Shape, Improvisation, and Observation **Look for concepts in the standards, content specific curriculum, etc.**

- Texture
- Multimedia
- Pattern
- Science

- Identity

Enduring Understanding (s):

Enduring Understandings **show a relationship between two or more concepts**; connected with an active verb. The best enduring understandings not only link two or more concepts; but demonstrate why this relationship is important. Like concepts, they are timeless, transferrable and universal. **Align Standards, Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs) to Enduring Understandings.**

Scientists and artists can identify patterns in images of cells and be inspired by them (Comprehend: Make informed critical evaluations of visual and material culture, information, and technologies)

Multimedia artwork can represent who we are in many levels, through various representations of patterns, and textures. (reflect: Recognize, demonstrate, and debate philosophic arguments about the nature of art and beauty (aesthetics))

Identity can be used to inspire works of art that are based on science and created using mixed mediums. (create: Recognize, compare, and affirm that the making and study of art and design can be approached from a variety of viewpoints, intelligences, and perspectives)

Standards: (All lessons should address all standards.)

1. Observe and Learn to **Comprehend**
2. Envision and Critique to **Reflect**
3. Invent and Discover to **Create**
4. Relate and Connect to **Transfer**

Objectives/Outcomes/Learning Targets:

Objectives describe a learning experience with a **condition** → **behavior (measurable)** → **criterion**. Aligned to: Bloom's – Standards – GLEs - Art learning and, when appropriate, Numeracy, Literacy and Technology. **Should be written as:** Objective. (Bloom's: _____ - Standard: _____ - GLE: _____ -Art learning: _____ -Numeracy, Literacy, and/or Technology)

Given examples and a video, students will *analyze and design* cells that represent themselves using color, pattern, and texture, as well as having a nucleus, cell wall, and cell body. Blooms: Understand, Apply/ Standards: Comprehend Gle:1 The identification of characteristics and expressive features in works of art and design help to determine artistic intent

/ Art Learning: Conceptual, Ideation, Historical Content / Numeracy: Radial, patterns

Given clay, rolling pin, and clay cutting tools, students will *create a slab* that will fit their design for the cell. Blooms: Apply / Standards: Create Gle: 1. Use basic media to express ideas through the art-making process /Art Learning: Materials, techniques

Using textured rollers and found objects, students will *design a cell body* that represents them through pattern and texture. Blooms: Synthesize, Create / Standards: Reflect Gle: 2. Artists, viewers, and patrons make connections among the characteristics, expressive features, and purposes of art and design/ Art Learning: Expressive Features, Characteristics

Using various yarns and a fired piece, students will *weave a nucleus* using colors from their original design. Blooms: Create Standards: Create Gle:2. Demonstrate basic studio skills/ Art Learning: Materials, techniques

Using artist cards, students will *reflect* on their process and *name their cell* with a scientific name. Blooms: Synthesize/ Standards : Transfer Gle: 1. Works of art connect individual ideas to make meaning / Art Learning: Transfer, Critical Reflection

Differentiation:

Explain specifically how you have addressed the needs of exceptional students at both end of the skill and cognitive scale. Describe the strategies you will use for students who are already proficient and need growth

beyond what you have planned for the rest of the class, as well as modifications for students with physical and/or cognitive challenges. **Students must still meet the objectives.**

Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	A pre rolled slab with cutout shape	Will use textured rollers to create a pattern that they like
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	Planning, clay, tools	Will create multiple cells and assign “jobs” for the cells

Literacy:

List terms (vocabulary) specific to the topic that students will be introduced to in the lesson **and describe how literacy is integrated into the lesson.**

Nucleus, Cell Body, Cell Wall, Texture, Representation, Pattern, Color, Weaving, Multimedia, Clay, Microscopic
Artist card

Materials:

Must be grade level appropriate. **List** everything you will need for this lesson, including art supplies and tools. (These are the materials students will use.) **List all materials in a bulleted format.**

Clay, Rollers, popsicle sticks, skewers, boards, yarn, straws

Resources:

List all visual aids and reference material (books, slides, posters, etc. Be specific; include title, artist, etc. **Make reference to where the material can be found.** (These are the resources used by the teacher to support/develop the lesson.) **List all resources in a bulleted format.**

Image of Bacteria on Petri Dishes (appendix 1)

(Powerpoint Appendix 2)

Preparation:

What do you need to prepare for this experience? **List steps of preparation in a bulleted format.**

Powerpoint

Handout on rolling slab

Demo piece

Safety:

Be specific about the safety procedures that need to be addressed with students. **List all safety issue in a bulleted format.**

Action to motivate/Inquiry Questions:

Describe how you will begin the lesson to **stimulate student's interest**. How will you pique their curiosity and make them interested and excited about the lesson? **What inquiry questions will you pose?** Be specific about what **you will say and do** to motivate students and get them thinking and ready to participate. Be aware of the varying range of learning styles/intelligences of your students. Some ideas might include: telling a story, posing a series of questions, role-playing, etc.

Can artists be inspired by science? Can we design art that looks like science?

Imagine that you get to design cells that represent you, they are made out of your favorite color, they repeat your favorite color, and show your personality. If I am a bright and bubbly person how might my cells look? What if I am a quiet and calm person that really enjoys nature.

Show image of cell example:

What do you think this person likes? What can their cell tell us about them?



Ideation/Inquiry:

Ideation is the creative process of generating, developing, and communicating new ideas, where an idea is understood as a basic element of thought that can be visual, concrete or abstract. List and describe inquiry questions *and* processes you will engage students in to help them develop ideas and plans for their artwork.

Drawing Activity:

Hand out paper and markers for every table.

Everyone put your name and class code on the corner

Draw an example of a cell design on the board

Prompt students to design 1-2 cells that could represent themselves. What colors would they use? What patterns? What shape will it be?

Instruction:

Give a detailed account (**in bulleted form**) of **what** you will teach. **Be sure to include approximate time for each activity and instructional methodology: skills, lecture, inquiry, etc.** Include motivation and ideation/inquiry where appropriate; including what student will understand as a result of the art experience

<p>Day 1</p>	<p>Instruction - The teacher will... (Be specific about what concepts, information, understandings, etc. will be taught.) Identify instructional methodology. KNOW (Content) and DO (Skill)</p>	<p>Learning - Students will... i.e.: explore ideation by making connections, comparing, contrasting; synthesize possibilities for each painting technique; etc. (Be specific about what will be the intended result of the instruction as it relates to learning.) UNDERSTAND</p>	<p>Time</p>
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Greet Students at door and give them directions to grab their ticket and sit down.

Good Morning ! Many of you know that our next project is going to involve clay. How many of you have worked with clay? So some of you may come in with some prior knowledge on how to use clay.

Our new project is going to be inspired by something that we can't see with our normal eyes.

What do you think this is?

Slide 2



What do all of those colors represent?

Who can tell me what microscopic is?

It is something that is so small we can't see with our normal eyes.

We have to use microscopes which allow us to zoom in. What we are looking at are bacteria.

Can art be scientific ?

Can science be art ?

Have students explain their answers.

We are going to watch a video about an artist and a scientist that team up together. I want you all to pay attention to what they use and what it looks like.

Slide 3:

Pre-assess students' knowledge on clay

Students use will make connections to their prior knowledge, make predictions, create stories

Students will analyze their ideas about what is "art" and what is "science"

Will have to defend their thoughts

<p><i>turning living cells into art</i></p> <p>So, who was able to catch what they were using to create art? Wasn't it beautiful seeing how the cells move and grow?</p> <p>We all have cells, they make up all the different parts of our bodies. I want you all to imagine that you could design your own cell. And this cell would be what made you who you are. It would represent you!</p> <p>Slide 4 Our Clay cells will have patterns, textures. And we will use two main materials clay and yarn.</p> <p>Slide 5 Our inspiration will be real life cells so when we design these we have to make sure that it has a Nucleus which is the center of our cell, a cell wall, and a cell body. Looking at the cell what could you tell about this person?</p> <p>Slide 6 I am going to share some more examples just to get your ideas going. As you look at these I want you to think about your favorite colors, and how patterns can represent your personality.</p> <p>Drawing Activity: Hand out paper and markers for every table. Everyone put your name and class code on the corner Draw an example of a cell design on the board Prompt students to design 1-2 cells that could represent themselves. What colors would they use? What patterns? What shape will it be?</p> <p>Walk around to different tables to help them get started with their ideas. Ask them questions about color. Worktime 10 Min</p> <p>Check in with students How are the designs coming out? What are some examples you have come up with?</p>	<p>Watch example of how science and art can meet. Will begin forming ideas about what cells can represent.</p> <p>Give students criteria for their piece that will need to meet</p> <p>Connect their ideas to examples and begin forming new ideas. Look at how the material can be used with another material</p> <p>Begin planning their ideas by using color and line to represent their cell</p> <p>Analyze how a pattern could represent them? Will it have symbols, what colors?</p> <p>Allow students to share their ideas so they can validate their process</p>	
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	<p>-Why did you choose that pattern/ color?</p> <p>I will give you all 5 more min of worktime and then we will be cleaning up. When we line up you will take your ticket to the cart and your drawing will go in your class bin.</p> <p>It is time to cleanup. I need all tables to put away their markers in the bins and sit quietly to show me that you are ready to line up. Looking for ready tables? Call tables to line up have their work cleaned up and are sitting quietly.</p>	<p>and progress as well as get feedback from teacher and peers</p> <p>Give expectation of time and clean up duties</p>	
<p>Day 2</p>	<p>Who remembers what we did last class? What did we design? Does anyone remember what microscopic means? So today we are going to start rolling out clay so we can cut out our cells. Our learning target for today is “I can learn how to roll out a slab of clay and put my designs. I can create a cell with a Nucleus, a Cell wall, and cell body.” How will we know if we have been successful? What should our success criteria be?</p> <p>For you to get started I am going to do a short demo in the back. I will show you how to use the tools and how to use your design to create your cell. I am looking for quiet and ready tables to call back. Dismiss tables that are ready to the demo table.</p> <p>Instruct students to not lean over table so everyone can see. In front of me I have clay, rolling pins, some skewers, popsicle sticks and some pattern rollers. First I need to roll out my clay. You will need to do it on these boards so that they don't stick to your table. Believe me if you roll it on your table it will be hard to pull it out. I am making sure to move my roller around in different directions and I am also flipping my clay every once in a little while. I am about done with rolling and I need to put my name and class code. I am going to write my name and class code and then flip it to the other side, that will be the bottom of my cell.</p> <p>Now does this look like a good size for my cell? Does it look even?</p>	<p>Recall previous information from last class. Connect vocabulary with the project</p> <p>Synthesize the learning target into criteria that they can meet.</p> <p>Visually see how to use the tools and the steps necessary to complete their pieces.</p> <p>Understand the expectations for their piece. Putting name on it, size, thickness, etc.</p>	

<p>Now I need to start putting the designs on my cell. For my sketch, I used a lot of different patterns around the cell body. That represents all my random interests. I wanted it to look kind of crazy because I enjoy doing so many different things. Now if you look around my cell wall it starts to get calm. I wanted that to represent that deep down inside I am a calm person that loves to relax. I am doing a very simple pattern for my cell wall.</p> <p>Now I am going to cut out my area for my nucleus. Using this template, I am using a skewer to cut the clay smoothly.</p> <p>Now I am going to cut out my cell body from the slab. I can follow my design or I can freehand it. I want to make sure to leave enough clay around the nucleus and cell wall.</p> <p>What I need everyone to do is start rolling out their slabs and begin using patterns. Once you are done with the patterns plan where your nucleus will be so I can hand you the template.</p> <p>Have stacks of supplies ready for each table:</p> <ul style="list-style-type: none"> -Boards -Skewers -rollers -Straws -Popsicle Sticks -Rolling Pins -Clay <p>Walk around check in on students, ask questions about their designs</p> <ul style="list-style-type: none"> -How will you get this pattern on your slab? -Where are you going to put your nucleus? <p>Give students 10 min of uninterrupted work time.</p> <p>Call students attention by saying “Mona... Lisa”</p> <p>Ok I want to let you all know how much time you have left. By the end of class, we need to make sure our nucleus is cut out. We will have 10 more min of work time. I will then start giving you directions for clean-up. Remember cleanup with clay take a little</p>	<p>Understand my way of thinking to create my cell. How I chose my patterns and the meaning I give it. Allow them to analyze their designs to see if they are breaking down their information. Understanding a new technique with a new material.</p> <p>Walk through my thinking process and show them how to properly use tools</p> <p>Begin exploration of technique by trying out how much pressure to put on roller. Look at table mates for assistance. Able to ask teacher for further help.</p> <p>Time to let students try out new patterns, mess up, and create.</p> <p>Give students time warning to begin pacing themselves to finish.</p>	
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	<p>longer.</p> <p>Cleanup: Mona... Lisa</p> <p>Ok it is time to clean up. What I need everyone to do is to grab their board with their cell and bring it to the demo table. You can stack two boards ontop of each other but no more than that. You will then come and bring all the tools and put them in the right pile. I will hand out rags in case you need to wipe down your tables. After you are done show me that you are ready by sitting quietly.</p> <p>Facilitate cleaning by helping students organize materials. Direct students on proper way to put away their piece. Spray down pieces as they drop them off.</p> <p>Hand out rags for each table.</p> <p>Looking for ready tables.</p> <p>Dismiss tables that are cleaned up, and are sitting quietly.</p> <p>As class is lined up make sure to give them feedback on their progress. Point out good studio habits like perseverance, planning, exploration. Say goodbye to students as they walk out.</p>	<p>Understand new expectations for cleaning up a new material and how to care for it.</p> <p>Receive positive feedback on their work ethic and creativity. Allows them to have a good connection with the project.</p>	
Day 3			

<p>Student reflective/inquiry activity: Sample questions and activities (i.e. games, gallery walk, artist statement, interview) intended to promote deeper thinking, reflection and refined understandings precisely related to the grade level expectations. How will students reflect on their learning? A participatory activity that includes students in finding meaning, inquiring about materials and techniques and reflecting about their experience as it relates to objectives, standards and grade level expectations of the lesson.)</p>
<p>Naming your cell:</p>

Students will use an artist card to reflect on their piece and also name it. This will allow students to make that final connection between science and art. Students will be shown various scientific names as examples. Give students labels that looks like science labels to display their work at their table. Do gallery walk of cells to help students see what their classmates created.

Post-Assessment (teacher-centered/objectives as questions): Have students achieved the objectives and grade level expectations specified in your lesson plan?	Post-Assessment Instrument: How well have students achieved the objectives and grade level expectations specified in your lesson plan? Include your rubric, checklist, rating scale, etc.
Did they plan their piece with a sketch? Did they incorporate patterns and textures in their cell? Does it include a nucleus, cell wall, and cell body? Is their weaving in the piece? Did they name their piece?	Does the piece have a nucleus, cell wall and cell body? S-, S, S+ Does the piece have pattern, color, and texture? S-, S, S+ Does the piece use clay and weaving to represent the student? S-, S, S+

Self-Reflection: <i>After the lesson is concluded</i> write a brief reflection of what went well, what surprised you, and what you would do differently. Specifically address: (1) To what extent were lesson objectives achieved? (Utilize assessment data to justify your level of achievement.) (2) What changes, omissions, or additions to the lesson would you make if you were to teach again? (3)What do you envision for the next lesson? (Continued practice, reteach content, etc.)

Appendix: Include all handouts, prompts, written materials, rubrics, etc. that will be given to students.

1:





Make Your Own Scientific Name!

Once you know the meanings of some Latin and Greek words and word parts, it's fun to experiment and come up with your own scientific names. In order to combine the words, sometimes you need to drop letters, like an "s" on the end. Sometimes you need to add letters, like e, l, or o, in the middle, or an us or um at the end.

Check out our list of words and word parts, and try combining them to make up your own creatures. Once you've made up some names, try drawing pictures of your new creations! (By the way, did you figure out the meanings of the scientific names for the cheetah and the koala?)

Example: a *Cerobates dynatos* would mean a "strong horned walker." What might that creature look like? An *Erythroforis discordis* would be a "two-hearted red flower." Can you imagine a plant like that? Okay, here's one for you: what would an *Ominoclis leptoglossus* be?



giant anteater *Myrmecophaga tridactyla*
("eater of ants, with three fingers")

Word Lists

How It Looks

- acantho- prickly
- ac-, acies, acer sharp
- acoco- pointed
- acro- top
- adustus brown
- albus white
- angustus narrow
- barbatus bearded
- brevis short
- brun brown
- cephalos headed
- ceros horn
- cinereus gray
- collis necked
- compo- pretty
- cornutus horned
- di- two
- erio- woolly
- orythros red
- curys broad, wide
- folius leaved
- formis shaped
- formosus beautiful
- gigantos giant
- gravos heavy
- hapeluis soft
- hoplites armored
- humidus moist, wet
- ignis fire
- inermis bare
- infectus dyed

How It Behaves



African hedgehog
Atelerix albiventris
("ineffective fighter with a white belly")

- adephagos greedy
- aedes unpleasant
- allo- strange
- apateios deceptive
- atoleos imperfect, ineffective
- diligens diligent, careful
- dynatos strong
- ferox fierce
- garrulus talkative, chattering
- habros graceful
- idris skillful
- insignis remarkable
- malus bad
- nocopinus unexpected
- neo- new
- sophos wise
- tardus slow
- velox, veloci- fast, speedy
- xeno strange

What It Does

- altus high
- bates walker
- bianos blind
- carnis meat
- edestes eater
- frugis fruit
- gradus step, walk
- hyphantos weaver
- indagator hunter
- necto- swimming
- odonus smelling
- pedetes leaper



Papuan hornbill *Aceros plicatus* ("sharp point with wrinkles")

- phago- eat
- phoro, phorus carrier
- sulfcata furrowing, digging
- venator hunter
- vorus eating

Where It Lives

- amnicus of a stream
- aqua water
- aerios, aerus of the air or sky
- aura gentle breeze
- chorinos of the grass
- dendron tree
- diurnis daytime
- goo earth, dirt
- hylo wood, branch
- marinus of the sea
- monti-, montianus of the mountains
- noccis night
- potamos river
- silvanus from the woods
- terra land



chuckwalla *sauromalus obesus* ("fat dark lizard")

