After successful completion of this assignment, students will have shown competency in addressing the following Course Learning Outcome(s):

- **Create** forms of scientific expression alternative to traditional scientific journal publications that can still describe nuance and detail of scientific discovery.

  “The arts not only support scientific thinking but also expand and transform traditional STEM curriculum to invite deeper observation, imagining, and revision.”

  – *Lisa Yokana, The Art of Thinking Like a Scientist*  

**ALIGNMENT**

In this assignment, you will demonstrate the previously identified and explicated area of your chemistry research and create an example of it in an artistic endeavor. Artistic here is deliberately vague, and the attentiveness should be put on non-traditional scientific communication. While scientists rely upon journal publication for scientific, this is not the only way that scientific information and detail can be presented, nor must it be in written form.

**RESOURCES**

I encourage you to find a method of expression that suits your interests and skills. With your area of research in mind, pick a detail of that subject matter and present it in this new form. Your creative endeavor could take the form of visual arts, photography, 2D and 3D media, computer aided graphics and design, music, game designs, wearables and jewelry, dance, demonstrations, models, dioramas, creative fiction, etc. and are only a small portion of what might be applicable.

The following books and links may be helpful in making more of those decisions. In particular, the Greenberg and Patterson book has a plethora of options that may spur creative ideas:

  - [https://search.library.oregonstate.edu/primo-](https://search.library.oregonstate.edu/primo-).
Lisa Yokana, *The Art of Thinking Like a Scientist*

Aisha Asif, “In San Diego, students juxtapose art and science to learn about the deadliest cancer”—their slide show is particularly useful
  - Especially its link to the *Art of Newtonian Physics* and related links including *Absolute Zero*
    - [http://dp.hightechhigh.org/~ajgloag/projects.htm](http://dp.hightechhigh.org/~ajgloag/projects.htm)
    - [http://www.physicsa2z.com/](http://www.physicsa2z.com/)

ACS, Art & Chemistry
  - [https://www.acs.org/content/acs/en/education/students/highschool/chemistryclubs/activities/art-and-chemistry.html](https://www.acs.org/content/acs/en/education/students/highschool/chemistryclubs/activities/art-and-chemistry.html)

Dance Your Ph.D.
  - [http://www.sciencemag.org/projects/dance-your-phd](http://www.sciencemag.org/projects/dance-your-phd)

Other STEAM Resources (while many offerings here target K-12 education, many of their varieties of expression are fully applicable)
  - [https://www.edutopia.org/article/STEAM-resources](https://www.edutopia.org/article/STEAM-resources)

Look at some of these offerings that might constitute the role of arts in STEM education, often known as STEAM. Your subject matter should be represented clearly and informatively, though, as matters of arts include, may be oblique and hidden in their presentation to some degree and to the discretion of you, the artist. Make sure it is clear to you that the science is adequately represented, and if it may not be clear to the audience, include clearly in your blurb what the artistic creation intended (see *Blurb* below)

Your creative work can be related to your research in various degrees of directness or indirectness, process orientated or presentation orientated (though these are not the only considerations). For example, if your area of research was chromatography, a process orientated creation may exhibit the science itself in an artistic presentation contrasting paper-chromatography developments that present a particular image, view, or aesthetic point. A presentation orientated creation is more external or observational to the research point and artwork, it may involve: the descriptive or sequenced music of analytical chemistry instrument noises as they pump, separate, and analyze in an LCMS run; a photographic collage that depicts the messiness of preparing samples and the sleekness of chromatographic columns; or the artistry in spreadsheets or replications in chromatographic spectrum. These poles are not intended to be defined rigidly, so flexibility between is available as well.

Art is often time consuming, and good art is even more time consuming. While you should put as polished a point on this creation as possible, you may not have the time to be as
complete as you wish. This is understood and included in the expectations of the assignment and rubric. Do the best you can with the expectations of this assignment and the time allotted for this coursework in general.

Later in this course we will discuss how it might be possible to describe how the paradigms of art and paradigms of science can better be described and thus how their interaction can be better connected in a fundamental and philosophical sense, but for now do the best you can with this experience.

BLURB

As art pieces often exhibited, your presentation should include an artist’s blurb about the piece to describe the points of detail you intended to capture and convey. Write 250-500 words describing your creation and the scientific communication points to be included with your creation presentation. This should not be an excuse for the artwork, but to clarify hidden elements that may not be immediately apparent. The blurb should be concise though you may try to fit as much in that space as possible, remember it is also intended for the audience to read alongside your artwork. This is also a place to include notes on the media included and important notes on production and tools used. Your blurb should also include references used for discovering the science and other artistic inclusions, if necessary.

Include this as a PDF document to the main submission post.

SUBMISSION

As this in an online course, you must share this creation using a digital medium of some kind as well. Though the artistic creation need not be of digital origin (i.e. a movie of a dance, or photographs of an art installation made of moss make sense, etc.), whatever you do create must be accessible online in some way as video, audio, or document accessible to computers (PDF, presentation links, YouTube, Canvas/Kaltura tools, etc.).

Assignments should be posted in the appropriate discussion board with necessary embedded video, audio, documents, or links to the digital sharable media of your creative endeavor. If you have trouble figuring out how to do this for your creation, contact me and we can see what might work.

The artistic creation presentation, along with a written blurb, should be submitted online, properly referenced using ACS style guidelines, and consider readability and accessibility concerns as outlined by the Oregon State University guide.
<table>
<thead>
<tr>
<th>Rubric</th>
<th>Exemplary</th>
<th>Emerging</th>
<th>Beginning</th>
<th>Not-present</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Relevance</td>
<td>Chosen area of scientific research was understandable from creative work.</td>
<td>Specific scientific details were obscured, but the general idea of the piece was clear.</td>
<td>Scientific details or relevance was difficult to connect to art piece.</td>
<td>No scientific relevance could be observed.</td>
<td>5</td>
</tr>
<tr>
<td>Artistic Creativity</td>
<td>Effort and expertise created an artistic work or depicted experience that conveyed a significant detail of scientific discovery. Ideas and artwork were clearly synthesized to present a novel means of understanding the science. Methods used synergize with the ideas present such that new perspective or understanding could be conveyed through the creative work. Craftsmanship added to the experience.</td>
<td>Effort and expertise created an artistic work and conveyed scientific discovery, though may not be of high enough detail to foment further aesthetic appreciation. Ideas and artwork worked well together to present ideas and understanding. Methods and craftsmanship were additive in their conveyance of scientific ideas.</td>
<td>Effort or expertise was lacking in the ability to create an artistic or creative experience that could convey scientific understanding. Either too much science or too much art was dominating the submission. Details were obscured or absent from scientific understanding. Methods of artistic expression and/or craftsmanship did not add to the creation, or actively distracted the audience.</td>
<td>Creative work not present, or could not be found to relate to any aspect of science and the assignment.</td>
<td>30</td>
</tr>
<tr>
<td>Blurb</td>
<td>Explicated intent of artistic scientific expression of 250-500 words. Included references and media tool.</td>
<td>Written component may have been under or over limit, and/or vague at explaining scientific intent. Insufficient references or media given.</td>
<td>Written component did not sufficiently identify or detail scientific intent. No references or media given.</td>
<td>Not present.</td>
<td>15</td>
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Total: /50