

## Myriwell 3D Printing Pen Lesson Plan

### **Context** (InTASC 1,2,3)

**Lesson Plan Created By:** Doreen Rosevold

**Created:** February 16, 2016

**Lesson Topic:** Two-Dimensional Versus Three-Dimensional Art

**Grade Level:** 6-8

**Duration:** 2-50 minute class periods

**Kit Contents:** [http://odin-primo.hosted.exlibrisgroup.com/nmy:NMY\\_ALEPH:ODIN\\_ALEPH007736750](http://odin-primo.hosted.exlibrisgroup.com/nmy:NMY_ALEPH:ODIN_ALEPH007736750)

### **Desired Results** (InTASC 4)

**Purpose:** The students will create a simple two-dimensional drawing (striving for accuracy in representation) and recreate their drawing into three-dimensional designs using the 3D pen

**North Dakota Visual Arts Content Standards:**

- 8.1.2: Understand how different techniques are used to create visual art
- 8.1.4: Understand how different visual art materials, techniques and processes cause different responses
- 8.1.6: Use visual Art materials and tools in a safe and responsible manner

**Objectives:**

1. The students will be able to use a 3D pen to make their 2D drawings into a 3D work of art
2. The students will be able to identify the parts of the 3D pen
3. The students will be able to evaluate their own 3D art work
4. The students will be able to identify creative works that begin with 2D planning with the intent of converting them into 3D creations.

### **Assessment Evidence** (InTASC 6)

**Evidence of meeting desired results:** The students are able to follow directions by completing the project as described; the students will demonstrate safety in using an art tool; students are able to evaluate their art experience of using the 3D pen

**Student Profile Evidence:**

### **Learning Plan** (InTASC 4,5,7,8)

**Instructional Strategy: (Check all that apply)**

Direct  Indirect  Independent  Experiential  Interactive

**Technology Use(s): (Check all that apply)**

Student Interaction  Align Goals  Differentiate Instruction  Enhance Lesson

Collect Data  N/A

**Hook and Hold:** Hook (Anticipatory set):

- What if you could draw a picture of something and it could actually become what you drew? Wouldn't that be great? What would you draw? (Responses may be things like a car, a house, a horse, a diamond ring, etc.)
- Using a document camera, show the template drawing for a pair of glasses that you

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have made ahead of time (templates available via Google search)

- Ask the students to define what a 2 dimensional item is. (Answer: A shape that only has two dimensions (such as width and height) and no thickness. (draw pictures of square, triangle, circle, etc. on board or document camera) "It is often called "2D"
- Ask them to define what a 3Dimensional item is? (Answer: An object that has height, width, and depth, like any object in the real world. It is often called 3D. An example would be your body (or you could show them some of the items you have in the bag for them to choose from.)
- Ask the students if the drawing of the glasses is 2D or 3D? (2D) Now slip the plastic glasses on that you made ahead of time. Ask them if those are 2D or 3D (3D).
- Tell them that they are going to work with cutting edge technology today. show the following video:
  - 3Doodler. (2015, January 5). *3Doodler 2.0 launch video—the world’s first 3D printing pen, reinvented (official)* [Video file]. Retrieved from <https://youtu.be/emUIHFWcHck>

**Materials:**

- 2 3D pens & plastic tubing from the MaSU TLC kit (if school has purchased additional pens, consider having one for each student) (This lesson is designed to use the two pens in the kit)
- 3 D items placed in a bag (any items that would be draw-able at the student’s skill levels would be appropriate: suggestions: a pair of sunglasses, a die, a card (from a deck of playing cards), a small plastic dinosaur, pencil, a small box, a ring (costume jewelry), a Lego piece, a small calculator, a computer mouse, small figurines, etc.
- An 8X11 sheet of white paper for each student
- A pencil for each student
- A document camera
- 2 scissors
- A table set up separately with the ability to connect to two outlets (the two scissors will be on this table)
- Possible: magazines to use to find items to make possible 3D drawings from/ OR use to determine what items started as 2D with the intention of turning them into 3D items. (Ex. Cars, houses, etc.)

**Procedures:****Day One**

1. Show the students the 3D pen. Tell the students that is how you made your glasses! You had a drawing and you used that drawing to build up “real” glasses with the 3D pen.
2. Ask for ideas of where 2D art goes on to become 3D art? (answers: architectural drawings, car designers, clothing designers, furniture designers, etc.)
3. Tell students: before we can make something into 3D, we need to think about our project and draw it out. But before we even begin our drawing, we need to know how to use the 3D pen in order to make our 2D drawing into something that is 3D. We also need to know how to use the pen safely and effectively.
4. Demonstrate the location of the buttons and how to insert the plastic filament into the pen, use the document camera to do this so everyone can see. (Tell them that you will be testing them on the use of the pen to make sure they know how to use it and how to be safe with it,

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before they get to use it.)

- a. Show them how to plug the pen into the wall outlet and then into the pen.
  - b. Point out that the light needs to turn green before they proceed.
  - c. Tell them that they must never touch the tip of the pen because it is extremely hot
  - d. If they want to change colors of plastic, they must use the reverse button to get the plastic out and then snip the end of that plastic filament so that it works appropriately for the next person who uses it in the pen. If they do not snip the plastic, it makes the pen jam up.
  - e. Show them how they must hold the sheet of paper as they build up the plastic drawing with their pen.
  - f. When you are done with your 3 D project, you are to fill in your evaluation sheet and turn it in to the teacher.
5. After showing where the buttons are located, show them how the pen actually works by demonstrating it on a small drawing that you do with the document camera. Then use the pen to bring the item to “life”. A small flower or some geometric shapes would work fine for this portion.
  6. Ask if there are any questions.
  7. Pass out the quiz on the 3D pen. Have the students put their name on the paper and complete the quiz. Give them 10 minutes to do so. Tell them that if they have answered the questions correctly, they will be able to use the pen tomorrow to make their 3D project. If not, they will need to have a reteach lesson while the others begin their drawings
  8. Pass out a pencil and paper to each student
  9. Walk around with the 3D items in a bag that the students cannot see through. Let them reach in and draw out an item. This will be the item that they draw in 2 dimensions. (do not let them touch and choose. Tell them they have to draw out the first item their fingers touch.)
  10. Tell the students to draw a picture of the item they drew from the bag. Remind them that they need to draw as accurately as possible. Especially the outer area so that they can make an exact replica in 3 D form. (While the students work on their drawing, quickly correct the safety quiz. For students not passing the quiz, have them come to your table for another quick demonstration and another quiz afterwards. It will be okay to stagger the completion of their items as there will be only two pens available at a time.)
  11. If there is time at the end of class, those who have finished their drawings may start on building their 3D art.

**Day Two**

1. Remind the students that today they will be completing their 3D images of their drawings. They will need to work quickly as the pens will be used by others. They will also be evaluating their drawings and 3D items.
2. If students are waiting for the pens, they can do one of the following : draw another picture that could be used for their 3D item or use magazines to find items that could be made into 3D items to an interesting effect.
3. As students complete their projects, they should take them back to their seats and fill out an evaluation form. (if there is no time in class, this could be an assignment due the next day)

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4. After the evaluation form is completed and turned in, the students can watch items made from 3D pens at the following youtube sites:
  - a. Official Rainbow Girl. (2015 November 6) *3d pen: giant minion!! (Despicable Me minions) scribbler* [Video file]. Retrieved from <https://youtu.be/NwXb3MCR3Ic>
  - b. Official Rainbow Girl. (2014, May 16) *Fun with the 3doodler* [Video file]. Retrieved from <https://youtu.be/cXM3L7tv37k>

**Summary:**

Call on several students to show their 3D works to the Rest of the class.

**Additional materials:**

Name \_\_\_\_\_

## Evaluation of 3D Project

1. The part that I enjoyed the most about making my 3D project was:  
\_\_\_\_\_
2. The part of making my 3D project that I had the most difficulty with was:  
\_\_\_\_\_
3. If I was going to make another 3D item I would make a:  
\_\_\_\_\_
4. If I was grading my own 3D project, I would give it a grade of: A B C D (circle one)  
BECAUSE\_(explain the reason for your grade)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. One thing I learned about art from doing this project was:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Reflection** (InTASC 9)**Reflect On:**

- *Preparation*
- *Planning*
- *Teaching*
- *Student Engagement and Participation*

*Evidence of Student Learning*

**Standards**

Council of Chief School Officers. (2011, April) *Interstate Teacher Assessment and Support Consortium (InTASC) model core teaching standards: a resource for state dialogue*. Washington DC. Retrieved from [http://www.ccsso.org/documents/2011/intasc\\_model\\_core\\_teaching\\_standards\\_2011.pdf](http://www.ccsso.org/documents/2011/intasc_model_core_teaching_standards_2011.pdf)

North Dakota Department of Public Instruction. (2000) *North Dakota standards and benchmarks contents standards visual arts*. Bismarck, ND. Retrieved from [https://www.nd.gov/dpi/uploads/87/visual\\_arts.pdf](https://www.nd.gov/dpi/uploads/87/visual_arts.pdf)

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