

2-D to 3-D Toy Story: A Multi-Age Collaboration



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North Middle School
Everett, Washington

www.artectivity.com

About The Project



Art of Apex High School

2012 Monsters Project

<http://www.artofapex.com/2012/03/monster-round-2-building-packages.html>

Artitude:

Ms. Morgan's Website

2012 Ceramics Project

<http://www.easysite.com/artitude/home-1>

Timeline

14 actual class periods

September:

Contacted Elem schools about drawing pictures.

October:

Received pictures from Elem schools

Nov/Dec:

Taught MS basics of sculpture, clay and 3-D design

Late
January:

Students worked to plan and produce the toys in a variety of mediums set up as centers. 5 work days

Early
February:

Students learned about "Packaging" then created the right type for their toy. And continued on their toys. 7 work days

Early
February:

Toy Shop "Amazon Review" Day

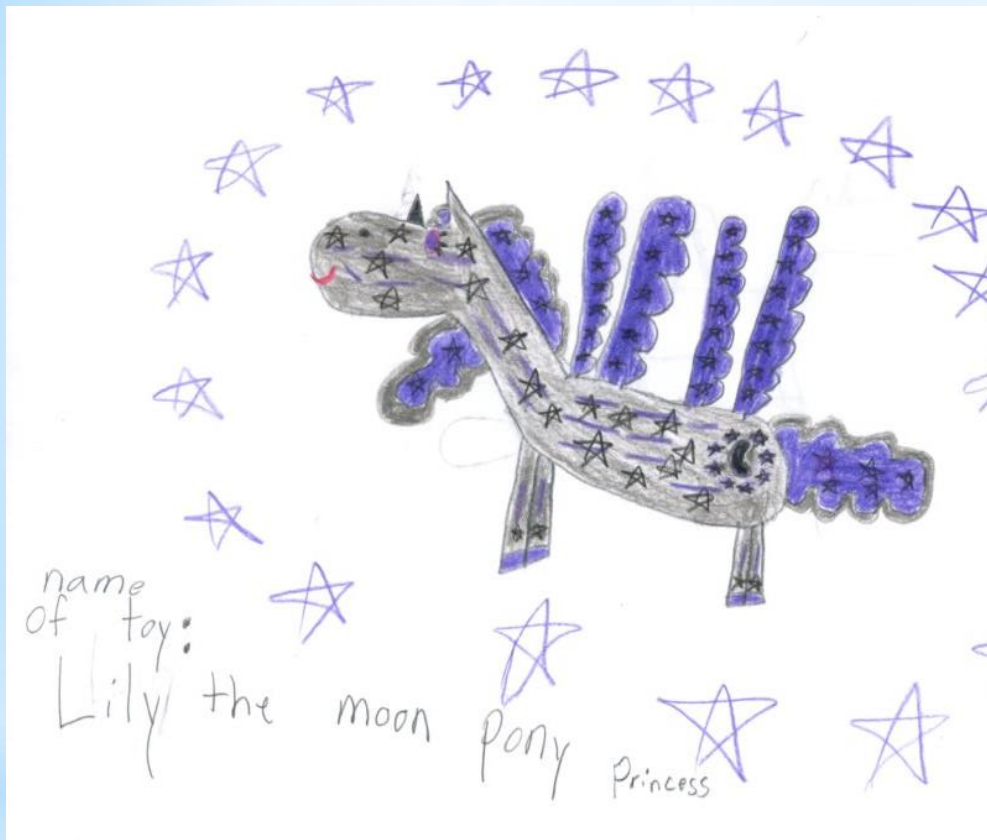
March:

Delivered Toys to Elem Schools
Received Thank You notes/Reviews

Toy Production Planning Day One

- Students received a packet with room for drawings, deadlines and reflections.
- We reviewed the choices with details about the steps for each art medium
- Students selected their “inspiration” picture
- Then selected a medium that would work best for them and the toy they selected
- They re-drew the toy making modifications necessary for their medium.

Step 1: Choose your kid designed Toy Drawing



Step 2: Choose your art medium

Fiber



Recycled



3-D Printer



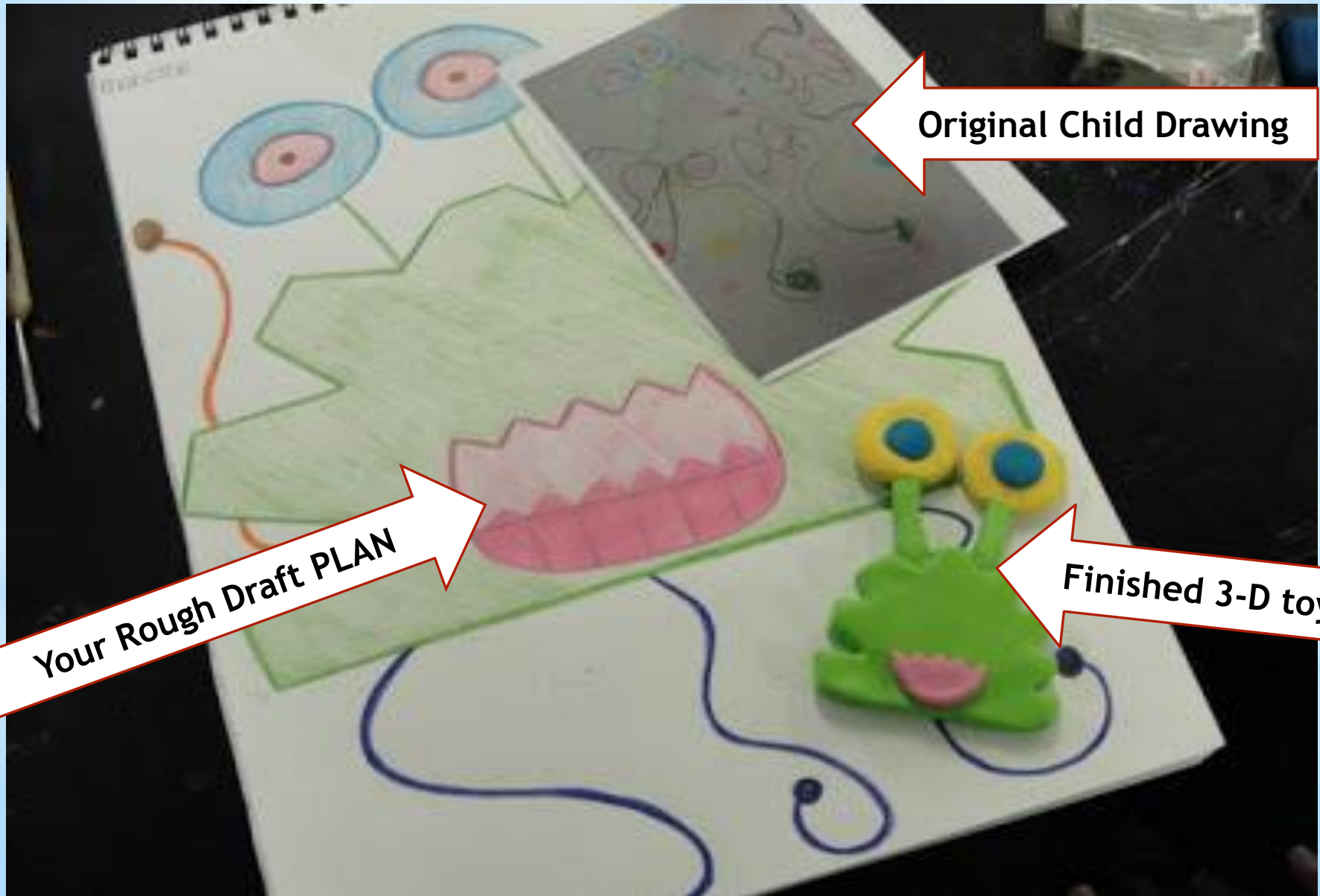
Modeling Clay



Ceramic Clay



Step 3: Create a rough draft PLAN/ drawing



Step 4: Create 3-D Toy (times 2 if desired)



All finished 3-D toys in the packaging will be sent BACK to the original kid artist.

IF YOU want to have a copy of the toy too, you must make 2 versions of it.

Step 5: Create Toy Packaging and advertising



Build a box to hold your toy with a “window” to show it off. Decorate the Box with advertising sayings and logos.

Use computer (print in color) or paper and paint/ markers to design packaging that shows off your toy.



MODELING CLAY TOY PRODUCTION

EASY: You have all used this type of clay in the recent sculpture unit.

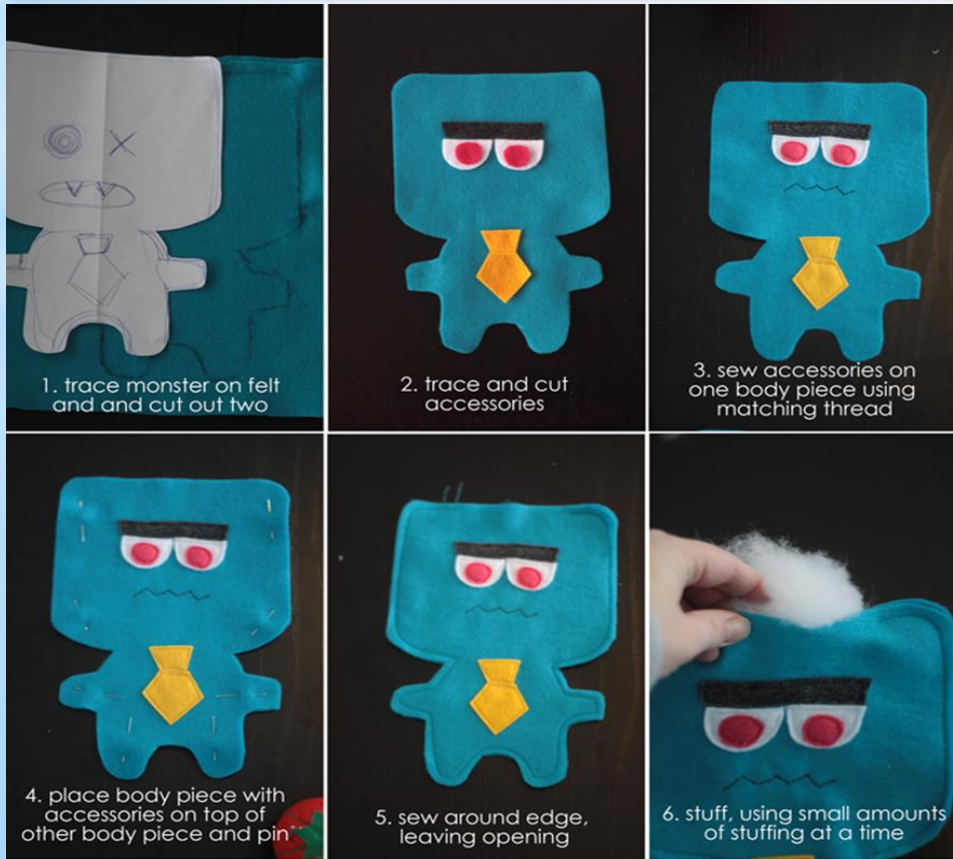


- 1) Re-draw design to match medium
- 2) Hand-build clay sculpture using modeling clay
Make sure it is FREE Standing and FITS into "Cam-shell"
- 3) Add texture and decorations
- 4) Complete packaging
Assignment

* Fiber Toy Production

Depends

Must already have some experience with sewing by hand or machine.



- 1) Re-draw design to match medium
 - 2) Make a pattern
 - 3) Cut, sew , stuff and embellish toy
 - 4) Complete packaging
- ## Assignment

* Recycled Toy Production

EASY to Difficult depending on YOUR sculpture skills



- 1) Re-draw design to match medium
- 2) Build out of cardboard, wire and other materials
- 3) Cover with Paper Mache' if desired or needed
- 4) Paint or color finished sculpture
- 5) Complete packaging Assignment

* Ceramic Clay Toy Production

Medium to Advanced!

Should have experience with making clay pinch pots.



- 1) Re-draw design to match medium
- 2) Hand-build clay sculpture flat or with hollow insides!
- 3) Wait for firing (work on packaging)
- 4) Glaze or paint finished sculpture
- 5) Complete packaging Assignment

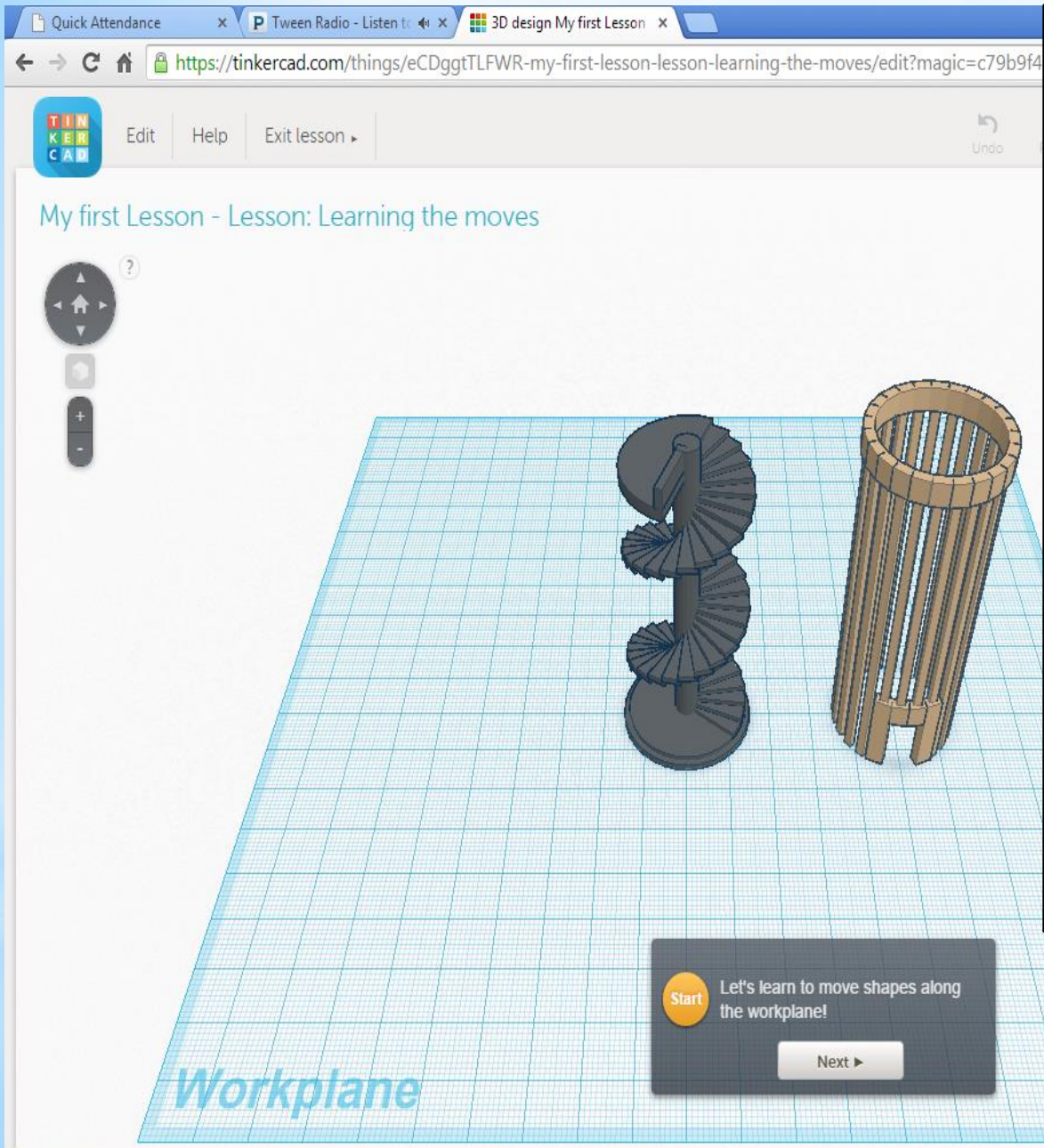
* 3-D Printer Toy Production

Advanced!

Must already be very good at Sketch-up or tinker cad.

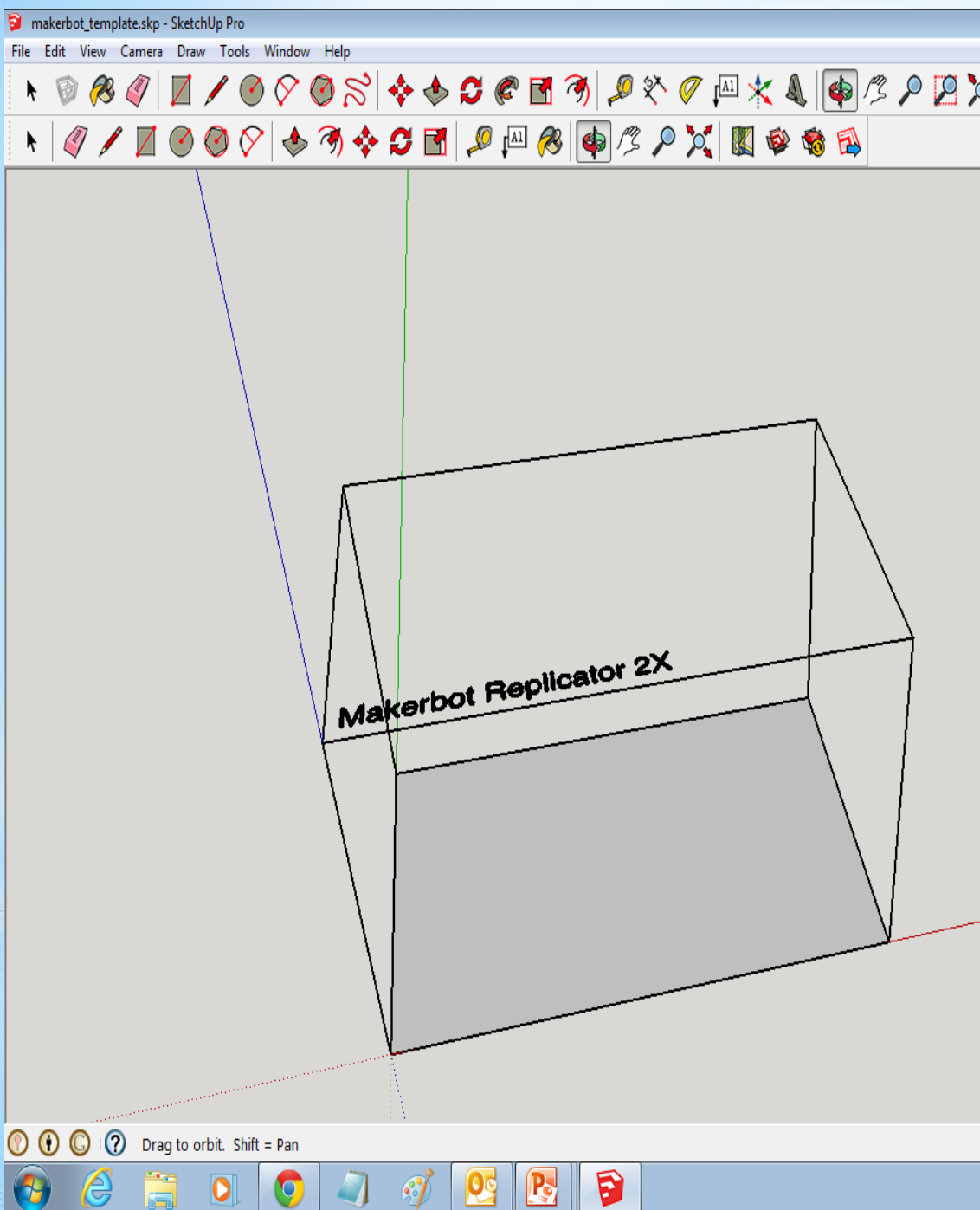


- 1) Re-draw design to match medium
- 2) Create a 3-D printer design with no overhangs
- 3) Get it printed.
- 4) Redesign if design did not work.
- 5) Complete packaging Assignment



Tinkercad

- ~make an account
- ~follow the tutorials to learn how to use the program
- ~look at examples that are similar to things you need to make.
- ~remix an existing work or build from scratch
- ~Save as an .stl file



SketchUp

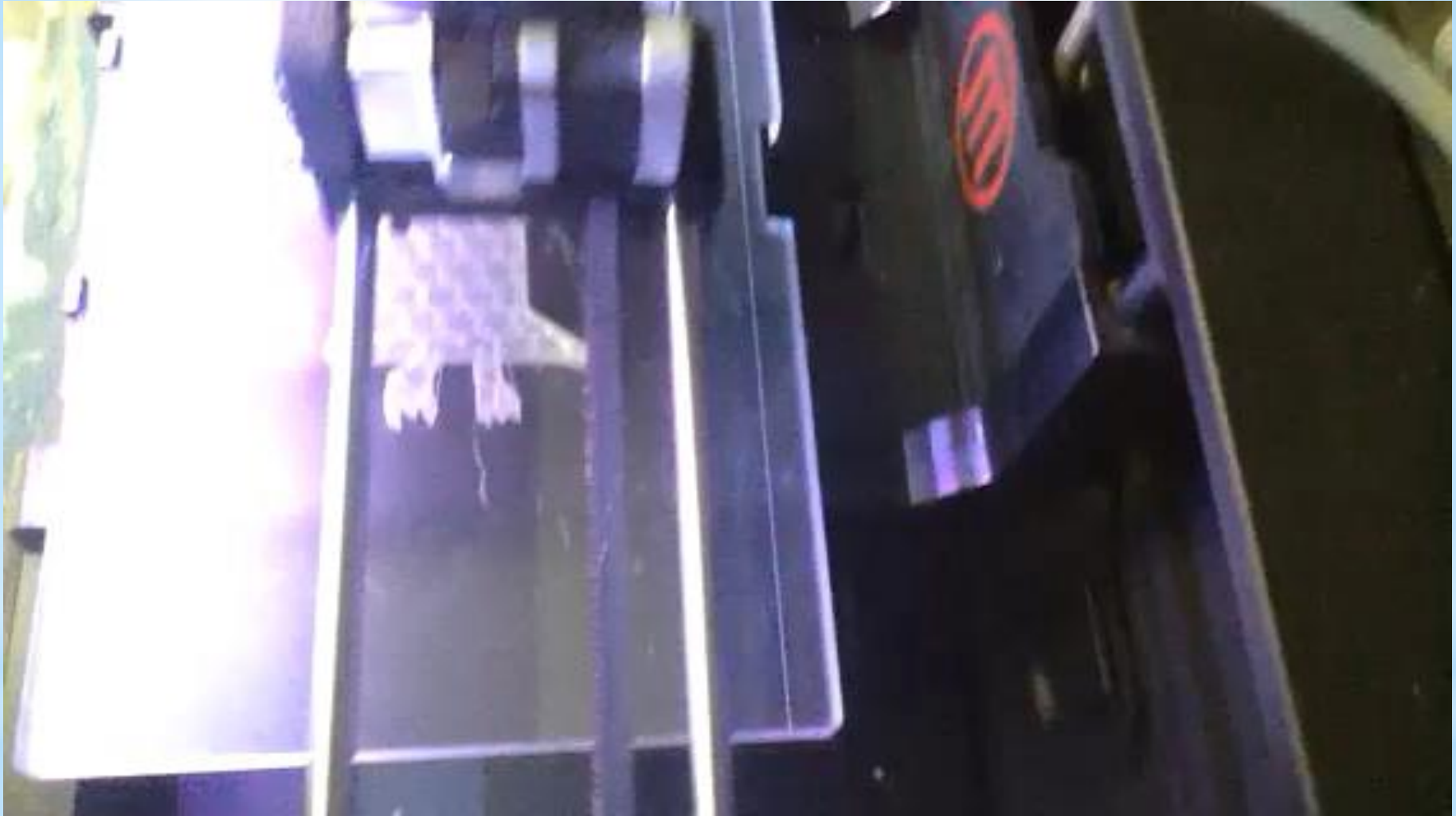
- ~Use the “Makerbot template” in the classes folder
- ~look at examples that are similar to things you need to make.
- ~remix an existing work or build from scratch
- ~build IN the BOX
- ~ make sure there are no “overhangs”
- ~Save as an .stl file

Drag to orbit. Shift = Pan

Measurements

9:20 AM
1/13/2015

* 3-D printer in action



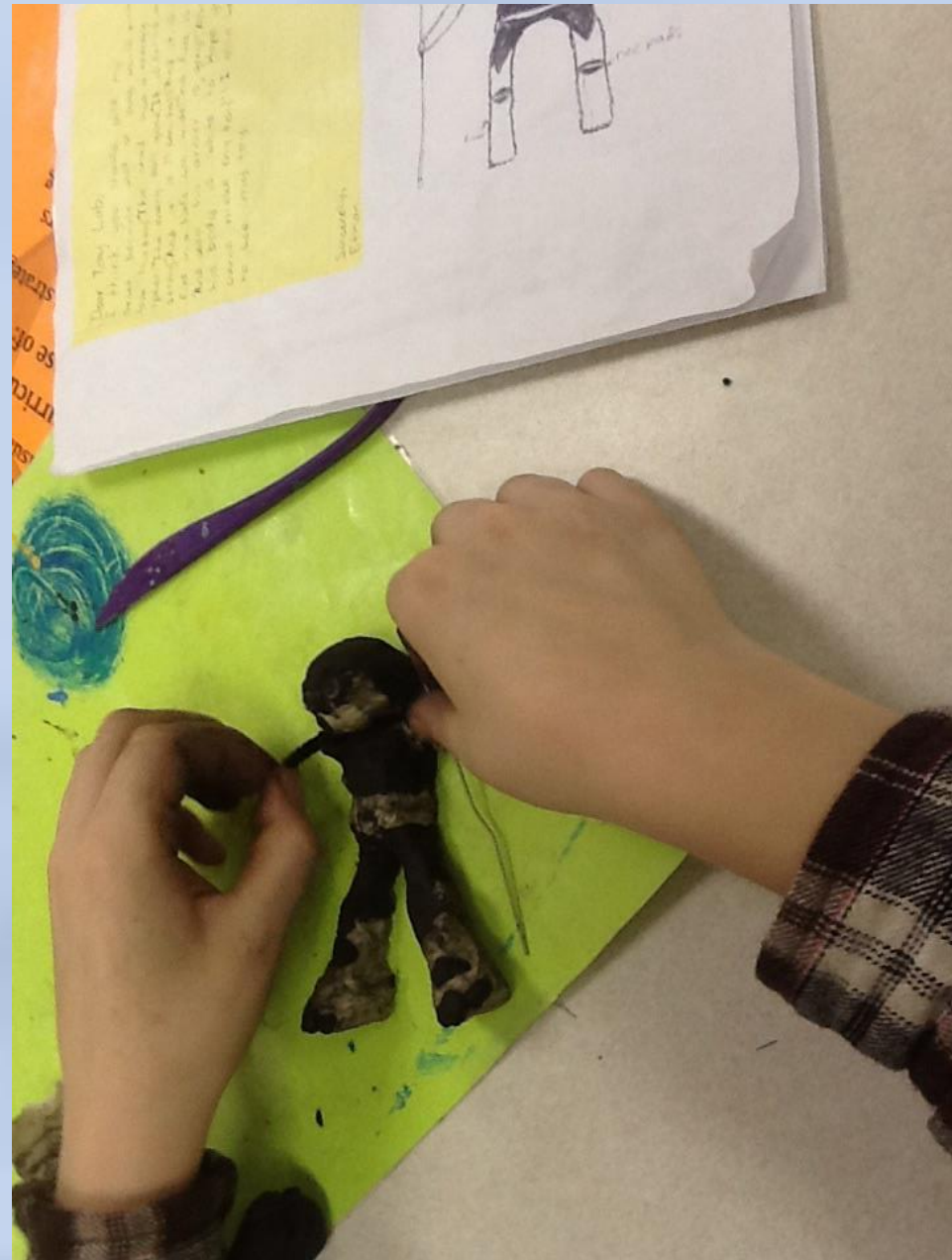
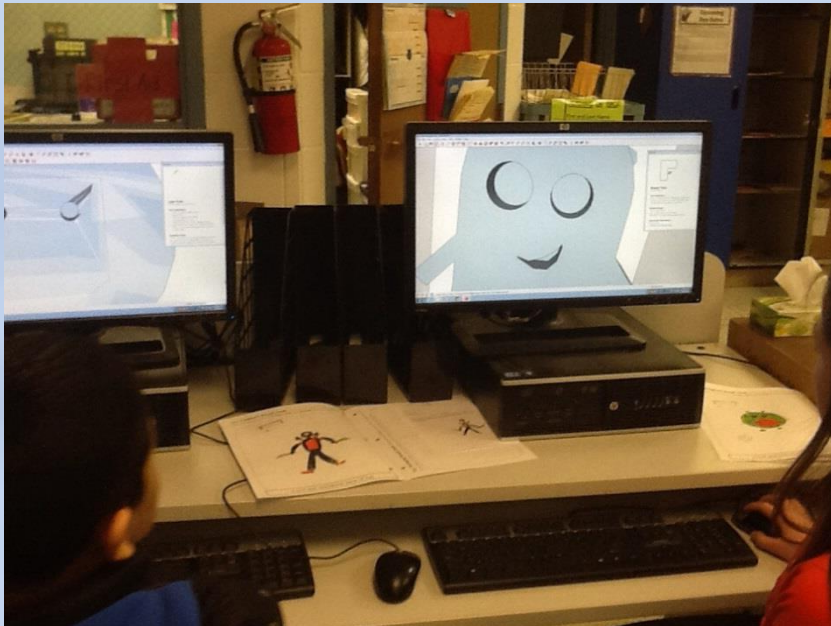
Toy Production Studio

- Seating was changed to have all students be at the “Art Media Center” they would need for their project.
- Students had their plan approved by me. Then were given special supplies as needed, or directed to the public access supplies to get started.
- Students worked on creating their project over a number of studio days. Between 2-7 days were needed for most students to complete the toy sculpture part.

Toy Production

Media Specific “Mini-Lessons”

- How to build a foil armature for modeling clay.
- How to open a template on sketch-up.



Toy Production

Media Specific “Mini-Lessons”

- How to design and use a sewing pattern.
- How to thread a needle.
- Which sewing stitch is best for a stuffed toy.



- How to use tabs and tape to secure cardboard to plastic.
- How to safely use a hot glue gun.
- How to secure sturdy clay legs, or how and when to modify to a sitting creature.

“Minosor”

Original Elementary Student’s Drawing



Wyatt
Mrs. French
Garfield elementary



Middle School
Student Planning
Sketch

My toy is awesome!

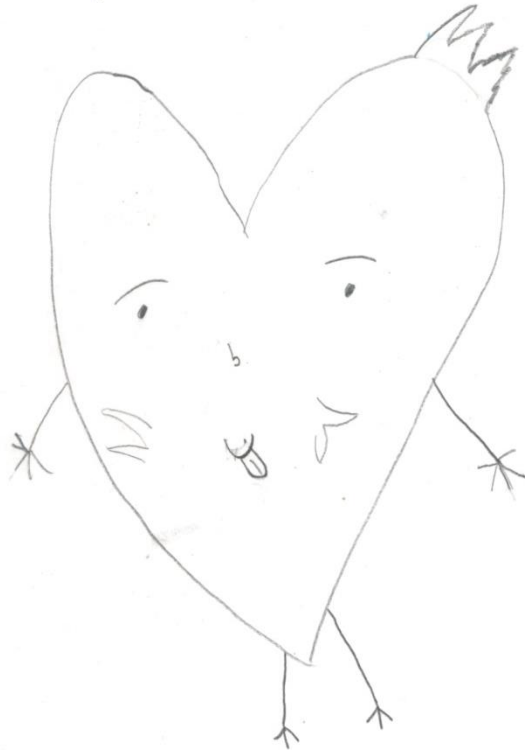
Indorsing the minosor it is scaly it's brit green lite black it hops for its pray it stretches it's neck to eats levs it wiggles it's tale when it's mad but it's gonna be hard to stop that's not good that's not good. Have fun!

Finished Fabric Sewn Toy



My toy is awesome!

This is the new Bella. Bella is some type of creature that poops out JELLY BEANS. And she's voice command. Also she loves to play, she eats jelly beans, when she eats she poops. She's like a dog or a cat. Bella has strait hair to. Also she's ticklish so that's my story. She loves to do tricks. THE END.



Original Elementary Student's Drawing

Bella



Finished Fabric Sewn Toy

Pink Cat

Original Elementary Student's Drawing



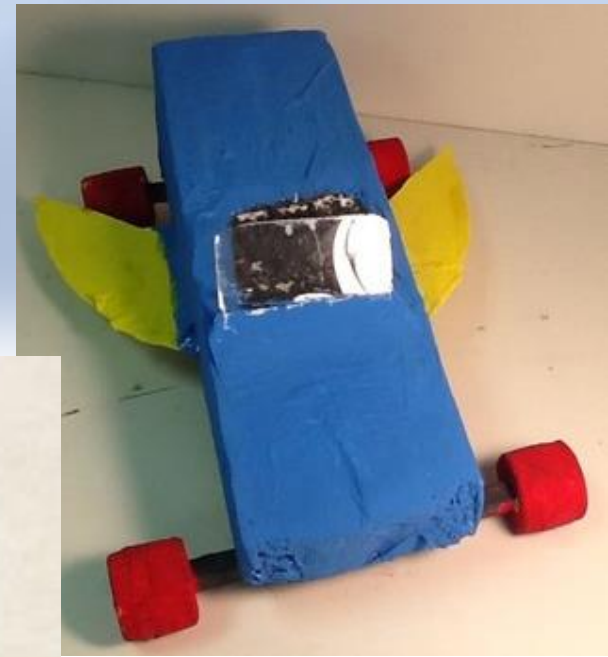
Finished Fabric Sewn Toy

Lamy Car

Original Elementary Student's Drawing

Introducing the new lamy car!

Wheels turn as the car changes. It is soft and fluffy. A lamp drives. It is five inches long, it has wings so it can fly. It is white, blue, yellow, red and orange!



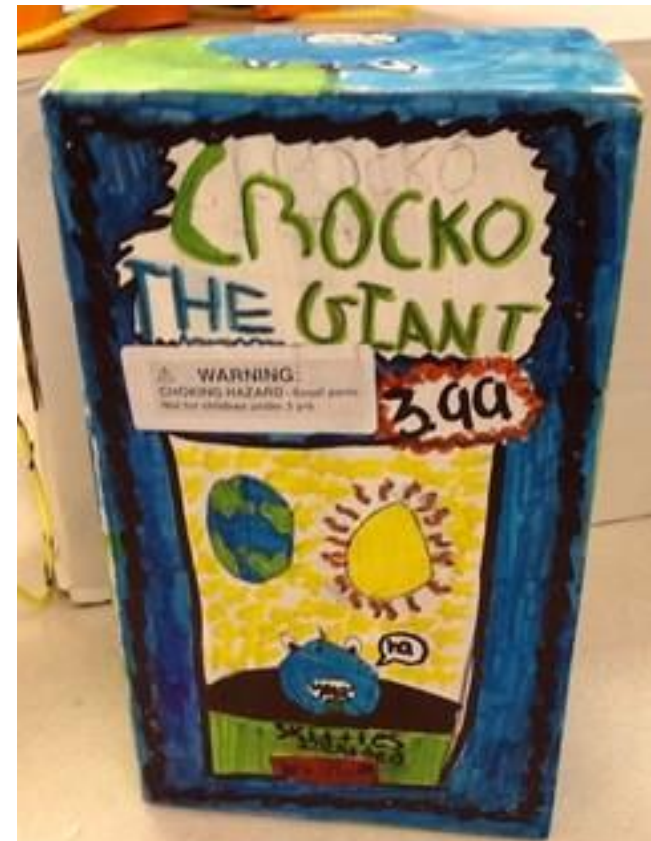
2 different versions of the Finished Toy

Crocko

Original Elementary
Student's Drawing



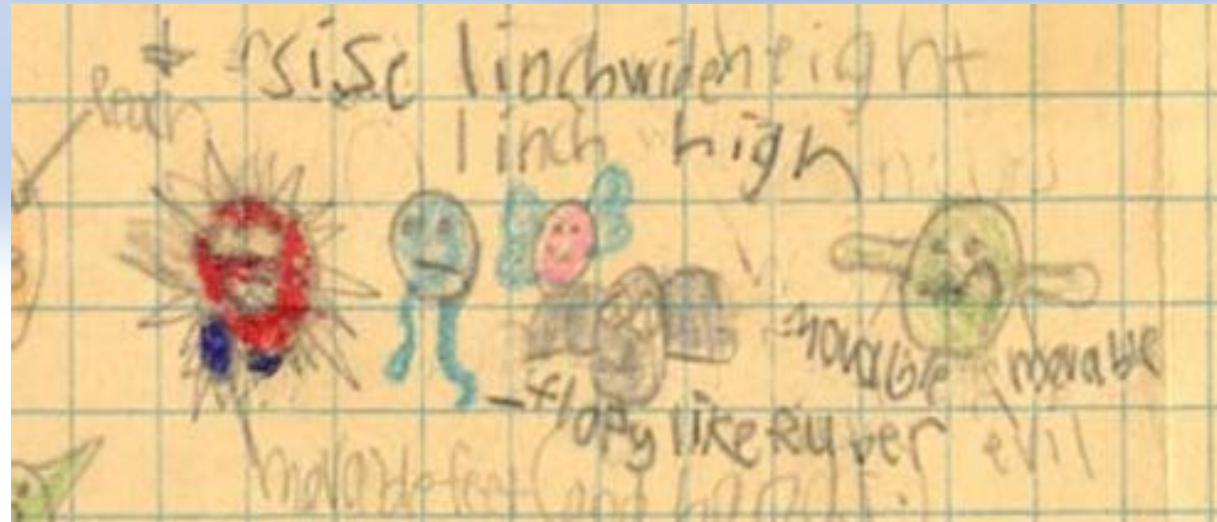
Finished Clay Toy



Packaging

Mini Monster Box

Original Elementary Student's Drawing



Finished Clay Toy



Packaging

“Stuffey The Alean”

Original Elementary Student’s Drawing



Finished 3-D Printed and Painted Toy



Toy Packaging

- As the first students were finishing the toy, I planned a break in the production to do instruction on packaging.
- The lesson included looking at real toy packaging and identifying the commonalities and making a list of requirements for their packaging.
- Students were in media related groups and had a toy that was similar in the type of packaging they would need to create. Cam shell, box or tag styles were discussed.

Group Discussion TASK:

1. **Examine** what type of information is on your toy's packaging.
2. Make a **list of the type** of information you found.
3. Come up with an answer to these 2 questions:
 - Why do we have packaging?
 - What do all toy packages have in common?

Discussion Expectations

- ✓ Quickly assign group jobs
- ✓ DO touch the packaging and examine closely
- ✓ Do NOT open up or remove toy!
- ✓ Do take notes about your discoveries
- ✓ Do NOT speak to people in other groups
- ✓ Do have something to share to the full class

Toy Package Requirements:

- ✓ Name of toy (*a catchy name that will sell*)
- ✓ Company name and information (address, website)
- ✓ Bar code
- ✓ Caution or Warnings (*what age group is the toy is appropriate for?*)
- ✓ Price
- ✓ Image of toy (possibly “in action” or in an environment or with other partner toys)
- ✓ Bold colors to attract buyers
- ✓ Large and Easy to read text

Optional:

Name of the “**line**” of toys (if part of a group)

Directions for assembly or use

Things that are “included” with the toy

Toy Production Studio

- Students that were not done with toy continued to work on toy after packaging lesson.
- Those that were done moved on to packaging, sometimes changing seats to the needed paint, computer or building studio.
- “Mini-Lessons” throughout on how to build or modify boxes, create viewing windows, and secure toys into the boxes.

Toy Packaging

Student Packaging “Box” Techniques

- Students repainted, modified and then decorated recycled food boxes of different shapes and sizes.
- Windows were cut out to show off toy. Old overhead sheets were cut and taped on the inside.
- Toys were secured to inside of box with wire or pipe cleaners.



Toy Packaging

Student Packaging “Tag” Techniques

- Different sized and shaped tags were created in the collage center with a variety of papers.



Toy Packaging

Student Packaging “Cam-shell” Techniques

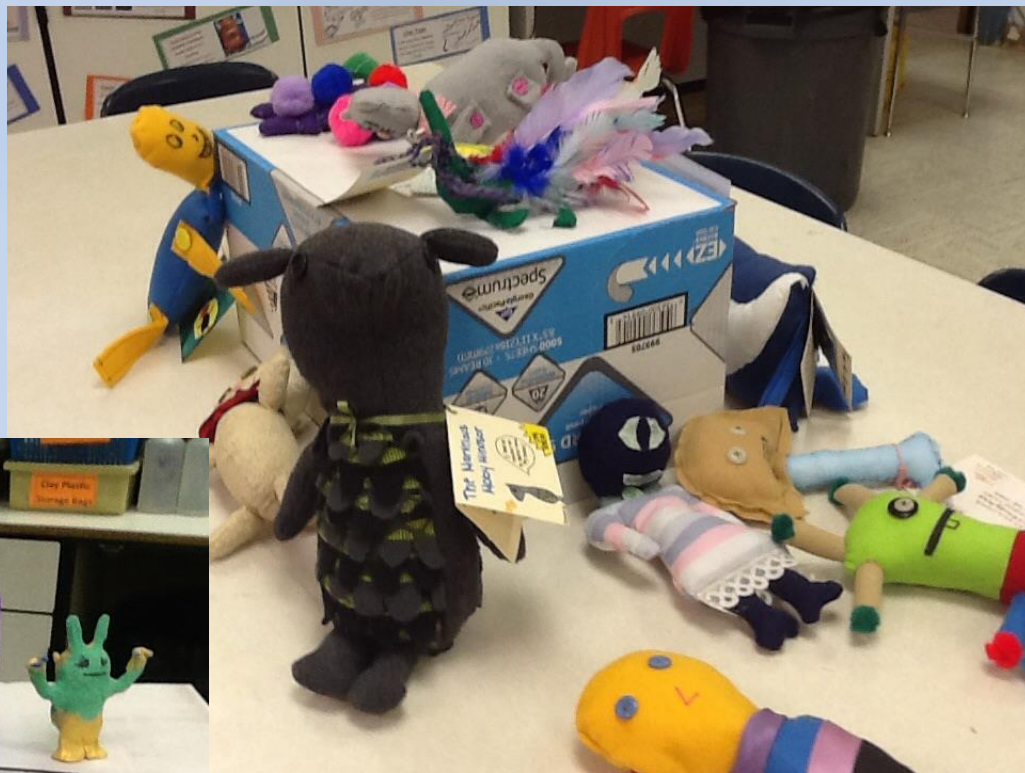
- Computer design with photoshop or MS paint were color printed, glued to cardstock and then laminated.
- Others colored with markers and/or colored pencils then glued to cardstock.
- Toy was secured to cardboard with wire.
- ½ or whole camshell was stapled, wired or hot glued onto cardboard



Toy Shop Day

- Finished Toys were put on display from ALL 6 Class periods, grouped by art media.
- Mini title cards with student name and toy name were near-by on post-it notes.
- Student received a couple “Amazon Review” cards
- We walked the toy shop examining toys “musical chairs” style.
- Students wrote reviews of the toys and placed under the post it note.
- Only finished projects got to be included.

Finished Toys were put on display



More about 3-D printing

1. Student designed project using Tinkercad or SketchUp (*FYI: Tinkercad must be 14 or have a parent set up account. CHROME browser is required.*)
2. Have them “Export” the design as an **.stl file**
3. Teacher Loads .stl files into the Makerbot software to make a printable file. (*I did 3 models at a time*)
4. Teacher resizes as needed and then downloads the file for printing. (*slicing the models*)
5. Load SD card to printer and keep an eye on it to ensure correct printing.
6. Remove models from plate. (*Paint scraper*)

Tinkercad accounts

Is there a Tinkercad version for educators?

- Technically, No. However, Autodesk is working on an infrastructure for educators that will include many of the features that educators need, like classroom management, projects and team structures to better use Tinkercad and 123D Circuits in their classrooms. It's called Project Ignite - have a look at projectignite.autodesk.com
- However, Tinkercad now allows all ages of users - you just need an email address.

I want to create an account for my kid (under 13). What do I do?

- Your kid needs to start by entering their email address and birthdate. If they are under 13, they will be prompted to give a parent's email address to start the approval process.
- The parent will receive an email notification that they need to create an account as well - this will allow them to moderate and observe their kids' activities and usage. Once the parent account is created, they will need to conduct a \$.50 Paypal transaction OR print, sign and email a PDF form to tinkercad.parents@autodesk.com and we can verify their approval. (We're working to make this process easier).
- That will then link the accounts and both kid and parent can begin Tinkering.

Our 3-D Printer

Donors Choose

<http://www.donorschoose.org/>



I'm a teacher »

Projects Gifts About Help Hi, Cynthia

3-D Printing for STEM Robotics and Art

Ms. Phippard's technology project in Washington (Where is the classroom located?) | High Poverty



[contact this teacher](#)

My Students: "3D printing has the potential to revolutionize the way we make almost everything. The next industrial revolution in manufacturing will happen in America." -President Obama.

A 3-D printer will help my students experience the ... [▶ more](#)

My robotics students attended our district technology expo to present their work, and while there they saw a 3-D printer. They returned from that experience clamoring for a chance to work with the same technology.

They proposed ... [▶ more](#)

My students need a MakerBot to help them combine robotics, technology, and art while also learning STEM skills like manufacturing and problem solving.

Completed!

May 8, 2014
\$2,659 given
16 donors

Share ▼

MakerBot Academy - 3D Printing Bundle including filament **\$2000** plus tax and shipping

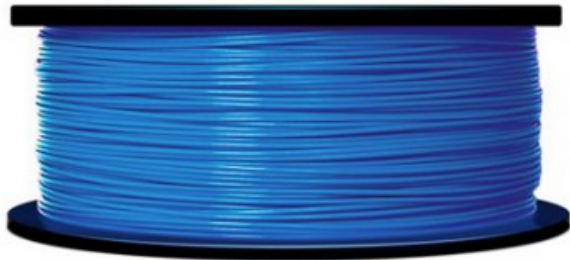
Makerbot

- Create on SketchUp or TinkerCad
- Can use a filter like Meshmixer to check for errors
- Use the Makerbot Software to set up and slice the print
- Save to SD card
- Start print!
- Wait 2-9 hours!



Extra Filament

- Between \$40–140 per roll, depending on color.
- Glow in the dark options!
- Plain white or “natural” for painting



MakerBot True Blue PLA Filament (1kg Spool)

by [MakerBot](#)

★★★★☆ ▾ 17 customer reviews

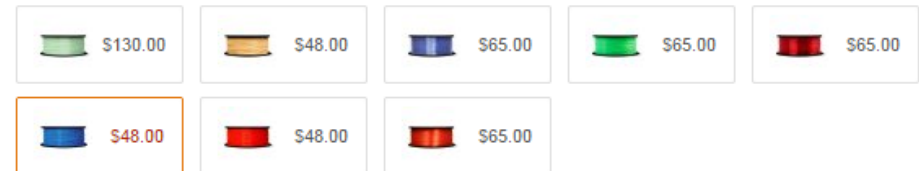
Price: **\$48.00** & **FREE Shipping**. [Details](#)

In Stock.

Sold by [MakerBot](#) and Fulfilled by [Amazon](#). Gift-wrap available.

Want it tomorrow, March 19? Order within **9 mins** and choose **One-Day Shipping** at checkout. [Details](#)

Color: **True Blue**



- The best and most consistent PLA filament for your MakerBot Replicator 2 Desktop 3D Printer
- Guaranteed to have no heavy metals, phthalates, or BPA
- Comprehensively quality tested at both 100-micron and 200-micron layer resolutions
- Easy to use and performs well on most prints
- Compatible with the MakerBot Replicator 2

3 successful prints ready to paint



Glitches we have had that are printer related...

~ **filament tangles!**

Everything is going fine, then the thin plastic filament gets tangled on the reel and stops feeding correctly.

~ **plate balance...**

If your printing plate isn't balanced then the hot melting plastic can't reach the printing plate evenly and the image gets off.



Glitches we have had that are design related...

~ We started with **SketchUp** because we are familiar with it. But every line and intersection is a piece of data that is ready to potentially glitch out the printer. Students that switched and reworked in **TinkerCad** were much happier with the results.



Other Glitches.....

~ **Slice Miscalculation?**

We think this one above was a slice malfunction. After you design you put the model into the Makerbot software, which slices the design for the printing. This one was printing perfectly and then suddenly the whole thing is printing one inch off!



Blog Links to Related Posts

Artsonia Gallery of Toys

<http://www.artsonia.com/museum/gallery.asp?exhibit=912384>

Toy Production Unit:

<http://www.artechtivity.com/toy-production-unit/>

Adventures in 3-D Printing:

<http://www.artechtivity.com/adventures-in-3-d-printing/>

<http://www.artechtivity.com/3-d-printing/>

Toy Packaging:

<http://www.artechtivity.com/packaging-for-the-toys/>

Toy Shop Day:

<http://www.artechtivity.com/toy-shop-day/>

About Me

- **Education:**

- BA~ The Evergreen State College
- MiT~ City University

- **Awards:**

- WAEA Middle School Teacher of the Year 2009
- PTA Teacher of the Year 2014

- **Leadership:**

- Presentations at National and State Conferences since 2006
- District technology instructor and peer mentor 2005-2010
- WAEA~ Awards Chair, Magazine Editor and President Elect
- District PLC Team Leader



Ms. Cynthia
Gaub

About My School

Built in 1981, North Middle School sits where one of the city's first schools was originally built. It is located in downtown Everett, one of the oldest (1890) cities in Western Washington, 25 miles North of Seattle.

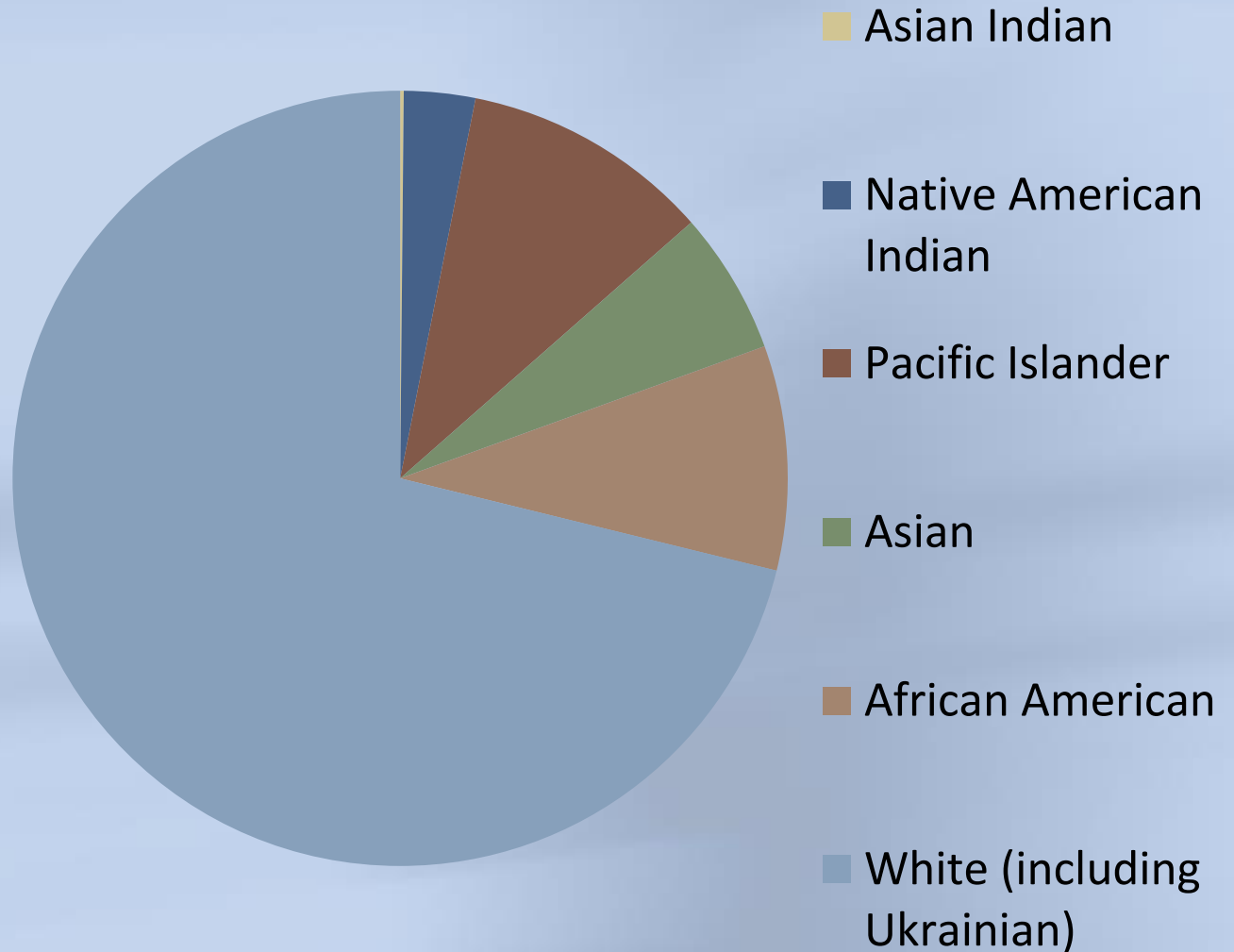
This Urban school is situated in an area of high poverty, homelessness and concentrated areas of new immigrants. Over 18 different Home Languages are spoken by students in our schools, English and Spanish are the 2 most common.



North Middle School
Everett, Washington

Student Population

ELL	13%
SPED	19%
Free/ Reduced Lunch	68%



About My Classes

Time:

- Daily, 45-55 minutes depending on the schedule
- Semester or Year-long sometimes depending on the period.

Curriculum:

- “Teaching for Artistic Behavior” Modified Choice program with exploring media units and themed art units using the medium of their choices.

About My Classes

Student Make-up:

- Mixed grades
- Mixed ability level, some have had art before, most not.
- Mixed SPED, ELL, Gifted and General Ed populations in the same classes.

Support:

- Admin love what I do and are supportive
- Para-Eds for some classes with high percentage of SPED or one-on-ones.