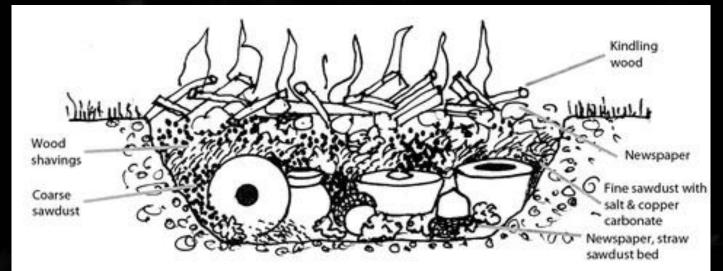
# Project Glaze: Barrel-Firing Technique

### History of Barrel-Firing

- What is barrel-firing?
- First we need to understand "bisque" firing vs. "glaze firing"

### Pit-Firing



## Raku Firing



### Artist Inspiration: Jane White







#### Our Experiment

To conduct a pit-fire above ground, we experimented with "barrel-firing".

This process includes punching holes in metal trash cans and replicating the pit-pire inside the container.

We will do three rounds of firings, each with three different trash cans. Firing 1: All natural materials

Firing 2: Chemical washes

Firing 3: Combining everything together

### Hypothesis

We believe that the natural materials will be more inclined to produce interesting textures whereas the transition metal washes will produce more consistent, vibrant colors.

#### **Our Controls**

Why did we choose to make a cup and vertebrae for each material? How do we control the barrel firings to produce comparable results? How will black smoke affect our results? How will dryness of materials affect our results? What kind of weather did we work in?

#### 33 COLORANT MATERIALS TO ADD TO A PIT OR BARREL FIRING

Colorants can be added in the sawdust layers, spriviled on or around each bleck, or thrown at the pieces during firing. Each of these techniques could produce ultiment insuits. The presence of copper, sait, and and are the key to getting significant colors in the pic.

Material	Color(x) It May Produce	Haterial	Color(x) It May Produce			
Baredust	black, gray tour-gray	Nutshells	1211545			
Cow plies (grain-fed)	snes projublick brows blue	Citrus rinds	VIENN			
Cow piers (grass-fed)	black, peliger	Ten hegs	101203			
Cat Sitter	eertoon	Table salt	pratign, yellow			
Back	Hertfolm.	See saft	baimon, orange, yellow; gold, peach			
Dried flowers	percul.	Recon groove	International Contraction			
Laters	Linburg, grount	Banana peat	ipresent, group			
Grass clippings	Sriceri, green	Coffee grounds	Brown, green, She			
May or straw	out inch	Bones	store			
Pinecones	101104	Dry dog or cat food	Voltani,			
Pine needlex	+070u6	Multivitamins	rantus			
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Kelp pods	uninge, brown	Epson salt				
Egyphetis	Independent Institute	1. N.				

""Verious" indicates that results any not consistent arrough to accurately guess what color they will create.



#### 33 COLORANT MATERIALS TO ADD TO A PIT OR BARREL FIRING

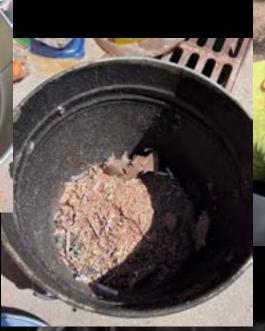
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		Bones	stor
Egyphelis	Independent International		

""Verious" indicates that results any not consistent arrough to accurately guess what color they will create.

## **Process: Barrel-Firing with Natural Materials**







1. <u>Eggshells:</u>Texture

### Eggshells contain calcium carbonate which is not highly flammable.

#### 33 COLORANT MATERIALS TO ADD TO A PIT OR BARREL FIRING

Colorants can be added in the savedust layers, sprinklad on or around each blace, or theorem at the places during fining. Each of these techniques could produce ultiferent results. The presence of copper, salt, and into any the key to parting significant colors in the pt.

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Cow pier (grass-fed)	block, yellow					
Cat Silter	eertoos					
Back	Heriota.					
Deled Rewers	percuit.					
Leaves	Arben, prost					
Grass slippings	Sriceri, green					
May or straw	ortion					
Pinecones	antitus.					
Pine needles	verious					
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Kala leaves	yetine orange peach					
Kalp peds	uticage, brown					
Egyptietts	Inversion to inverse					

Haterial	Color(x) It May Produce
Nutshells	1005945
Citrus rinde	Vietore
Tan hags	101010
Table salt	proston, prilow
See salt	salmon, orange, yellow, gold, peach
Bacon groave	Desserv greater
Banana peal	ipholeti, group
Coffee grounds	Britwin, Steen, Silver
Bones	store
bry dog or cal facel	Soloni,
Multivitamins	VANDUS
Statute and a	retired
Alum	1001044
Copper wite	rest black blan green altile (depends on the size)
Steel wool	Adust gray, park
Naila	biok-gray dots with halos
Epson salt	vatione

"Verious" indicates that results are not consistent enough to accurately guess what color they will create.

1. <u>Eggshell Results:</u>

They not only left an interesting texture, but there is a subtle burnishing of yellow that is likely a result of the egg itself.



2. <u>Chicken Bones:</u> Blue

Chicken bones contain calcium carbonate

and phosphate.

Phosphorus produces a pale blue-green flame

when added to fire.



2. <u>Chicken Bones Results:</u>

Because the chicken bones are not made entirely from phosphorus, this may be a part of the reason there is not much of a colored effect on our pieces.



#### 2. <u>Banana Peels:</u>Green/Grey

Banana peels are high in potassium. When potassium is added to fire, it can produce a lavender flame and green vapor.



#### 3. Banana Peel Results:

We chose a mixture of damp and dried peels since potters often experiment with both. The product did not yield much of a color, but if you look closely at the form, you can see a small texture left behind by the veiny parts of the peel.

\* many of the peels were likely too wet!



#### 4. <u>Orange Peels:</u> various results

Like a lot of the natural materials we chose, orange peels

are mostly made of organic compounds. There is not a

predominating element in this materials that may

affect the color.

Organic compounds typically release a brownish gas.

#### 33 COLORANT MATERIALS TO ADD TO A PIT OR BARREL FIRING

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Marke leaves	yetine orknoe peech	Naila	biolegray dists with halos				
Kelp pods	utanga, brown	Epson salt					
Egyptietts	Independent Intelligie						

"Werlows" indicates that results are not consistent enough to accurately guess what color they will create.

#### 4. Orange Peels Results:

These are also a mix of damp and dry peels. They did not

promote the fire too well and that is likely why there is not a dense amount of black smoke. There is a small amount of brown staining.



5. <u>Dried Flowers:</u> various results
We used a miscellaneous bouquet of flowers.
The different natural pigments of the petals may
leave staining behind on the pieces.



5. <u>Dried Flowers Results:</u> texture!

The dried flowers left behind a beautiful silhouette.

Since we used completely dry materials, the fire produced a very dense amount of smoke and coated our pieces entirely with the black color.



6. Tea Bags: various results Similarly to orange peels, there is no predominating element. Black tea contains a lot of polyphenols which are organic compounds. Organic compounds tend to release brown gas.



#### 6. <u>Tea Bags Results:</u>

Since this material was placed in the barrel with the dried flowers. The dryness helped produce a lot of black smoke. There was a lot of texture left behind by the teabags.



### **Results: Natural Materials**

Chicken Bones, Flowers, Tea Bags









## **Results:Natural Materials**

Banana Peels, Orange Peels, Egg Shells







## Results: All Natural Materials



#### Conclusion and Issues

A lot of our results reveal blackened, textured materials, but we were anticipating more color.

We ran into issues keeping the fire ignited in the small trash cans and our use of sawdust as the main combustible material did not help either.

With this in mind (and the unease of public safety), we placed these smaller trash cans in larger ones. This switches up our controls, but it is necessary if we want to proceed with successful firings.

## New Firing Method



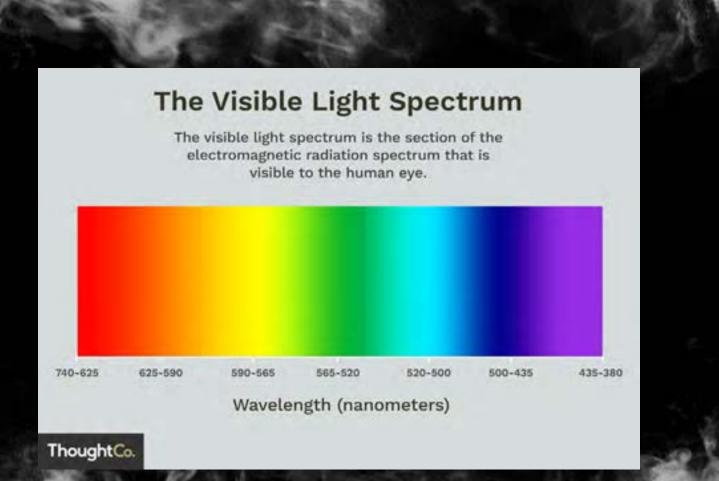




### Why Transition Metals?

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1-25. The poter's periodic table. Elements useful to poters. The paps in the table are elements not used in detamats. Some elements are only present in organics in trace amounts, but are included for completeness, e.g. Germanium, Arsenic PG 22 of *Science for Potters* by Linda Bloomfield



### Formulas from *Amazing Glaze* by Gabriel Klein

#### <u>Cobalt Wash –</u>

- 50.00%...Ferro Frit 3124
- 50.00%...EPK
- With an additional 25.00%...Cobalt Carbonate

#### <u>Red Iron Oxide Wash -</u>

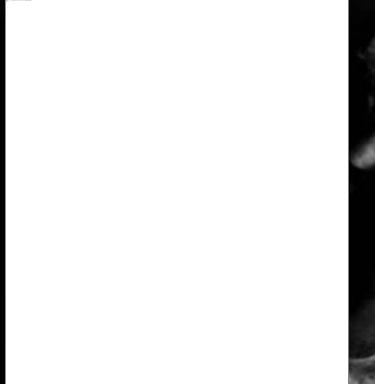
- 50.00%...Ferro Frit 3124
- 50.00%...EPK
- With an additional 50.00%...Red Iron Oxide (Fe2O3)

#### <u>Copper Oxide Wash -</u>

- 50.00%...Ferro Frit 3124
- 50.00%...EPK
- With an additional 50.00%...Copper Carbonate

## Process: Chemical Washes











## Results: Chemical Washes

#### Copper Oxide Wash, Cobalt Wash, Red Iron Oxide Wash



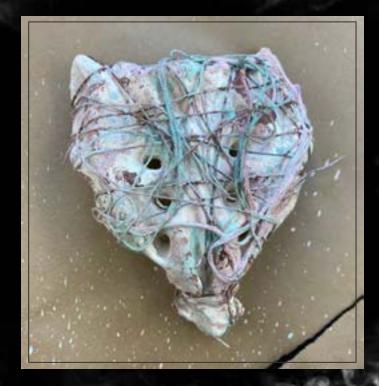






## Combining it All Together







## **Results: Natural Material Combination**



## **Results: Chemical Wash Combination**



## Results





## Results: Mixture of Everything!



### **Results:** Everything!





### Special Thanks to Dr. Carlisle!

## Questions?

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