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Hi everyone, my name is Dolph Petris and welcome to my presentation called Brick Abstraction. It started, well first of all let's start with this, how is your summer vacation so far? I hope it's going great.

My project actually started this year by reading a children's book that you'll see I'm my video presentation and then from there I wanted to make some kind of a project out of that because it touched on abstraction and I really like abstraction in art, or in anything really.

So I thought okay, so let's turn this into an art project and it ended up taking on elements of science, definitely technology, definitely engineering, definitely art and definitely math as you'll see, and as I lay out in the three different phases of Brick Abstraction.

There's going to be two different levels of abstraction within the three phases, you'll understand much more what I mean when you see it. It stems from creating an original object and then creating an abstraction of that object and then creating an abstraction of the abstraction. So you become removed, one more step removed from the original piece every single time.

Now, if I were to tell my students, "All right, we're going to create something and then you're going to make an abstraction of it," they wouldn't really know how to process that. So what I did was, we went through three different phases and within each phase they had a specific task to work on and then the next phase, then they used information from the previous phase. The whole project took about three and a half weeks to do. So it's not anything that you can do in a very short period of time but I mean, you can extend it. You can modify it and make it shorter or you can make it even longer. It's really up to you and you'll see that any and every grade level can be involved in this.

So, I'm really excited with the results of this project and I hope that you enjoy the work that we did and that I'm presenting to you from my class this year. Definitely my email will be up on the screen and you can email me at any time. You can also ... send me a message on Twitter if you'd like as well, but let's get on to it and I hope you enjoy, take care.



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While you view this presentation, please remember that the grade levels that you can use this with are really any grade level. I would suggest probably beginning with grade three but then on up, four, five, six, seven, eight, you can take this all the way through high school even. There will be various stages that I'm going to explain so just kind of bear with me and you will see how it all comes together. It is full steam ahead as we use all aspects of STEAM, science, technology, engineering, art, and math.

The foundation of our project is using Lego bricks or you can use any brick building tool or toy that the kids like to use depending on the age and grade level. As I said before, it's a multi stage project, it is a three phase implementation and it takes brick building to a whole new level.

Phase one is the foundation of our abstraction assignment where students use the Lego bricks to create their model. Phase two is the first level abstraction phase and students use in this case, Chromebooks to create a 3D virtual model based on their original Lego model. So what happens is you get an organic abstraction that just happens because the student can not 100%, at this point in time in their early careers duplicate their Lego model.

Phase three is the second level abstraction where a painting is then created based on the 3D virtual model representation. So, once again, you organically get an abstract version, especially now twice removed from the original model that was created and it's really cool in this case because the kids don't, they aren't afraid that their painting doesn't look exactly like the original model because we know that we are moving away from the original design through the abstraction process.

My Brick Abstraction project started when I found this book called A Life of Color. This was the very beginning of the Abstraction Project, before even phase two or phase three occurred. It's a story of Sonia Delaunay and it's a wonderful book. She was an artist born in the Ukraine in the late 1800s and it's about how ... she depicts life through the colors that she uses in her image.

So, depending on what she's painting she believes that art touches part of our everyday lives and she wanted to convey all this wonderful stuff about life in her art, through movement, through color, through imagery that wasn't obvious. So this is how it started for me.



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Before my class even started working with Legos I led them through a discussion on the design process and its correlation with the steps of the Scientific Method. For the technology component of this assignment I used Chromebooks with my class and we used an online application called, SketchUp. I know that it was originally developed by Google, not sure if it still is, but it is still developed with somebody and it's free for anybody to use. It's an amazing tool that allows you to create 3D geometry in virtual space and you can measure, you can put color, you can create spline geometry, it's just pretty amazing and although it may look difficult and daunting from the very beginning, students catch on very fast.

For the engineering portion the students immediately become elementary school engineers because they now have to figure out how to build their model. This project uses two dimensional art, three dimensional art, visual art, and it's quite encompassing and so the students naturally just get into it.

The math component comes into play and the students don't even realize it, they're counting their Lego pieces, they're measuring them to recreate in the 3D virtual environment and they're having fun with it. There are many free Lego challenge cards that are available through an online internet search. I've included in my notes the, a couple of links for ... ones that I have used, a couple of them you will find that they'll want you to include your email address which is perfectly fine because they just want to have you on the list.

But nonetheless you just print them out, cut them up, and then randomly hand them out to the students, that's part of the excitement because they don't know what they're getting. All right, phase one, let's go into the classroom and see what the students are doing.

All right, boys and girls, so before you start to reach in and get the Legos, I want you to think about how you're going to construct what your card says, okay? Because that will give you some kind of an idea of what kind of pieces that you will be on the look for. All right and remember, once you get your Lego pieces, then take them to your separate area and then you can start building. You can go back, we obviously have a ton of Legos.

Speaker 2:  
[crosstalk 00:09:37].

Speaker 3:  
Let the games begin. [crosstalk 00:09:57].

Speaker 4:  
It's a musical instrument, a keyboard's a musical instrument. [Crosstalk 00:10:23].

Everyone was so engaged because they really enjoyed and took ownership in their own Lego challenge card that they needed to build.

Speaker 4:  
[crosstalk 00:10:34].

I was very impressed with the level of creativity that I saw in my students. Some were natural engineers and some were just very imaginative in their design.

Speaker 2:  
[crosstalk 00:11:22].

Ethan, so what are you making there?

Ethan:  
I'm just making a person, like with a, they're like heart and his hand showing his-

Aw.

Ethan:  
Yeah.

Almost like a waiter or something huh?

Ethan:  
Yeah but it's supposed to be sort of like a statue or something.

Oh okay, I see.

Ethan:  
Yeah.

Almost like a Statue of Liberty.

Ethan:  
Sort of yeah.

Speaker 2:  
Except without a torch.

Ethan:  
Yeah. And with a heart instead.

Awesome.

Speaker 6:  
I'm trying to make a piano.

A piano?

Speaker 6:  
Yeah.

Wow. Awesome. It looks like one.

Speaker 6:  
I guess so. It also kind of looks like an Oreo.

Kind of looks like a what?

Speaker 6:  
Oreo. If it was a sandwich sized.

Speaker 3:  
Try and make a grand piano.

Speaker 6:  
That's what I'm doing.

Yeah that looks pretty cool. I like that.

Samuel:  
A cloud [inaudible 00:12:28].

Samuel let me see. So what'd you make?

Samuel:  
A parachute Lego man that doesn't really fly.

Wow. Awesome. And rotate it around. Wow, cool. Nice job.

Edwin, what are you making?

Edwin:  
Rainbow. [crosstalk 00:12:52].

[Ratauna 00:12:52] what are you making?

Speaker 9:  
A crow.

A what?

Speaker 9:  
A crow.

Wow. Uh-oh. A crow. That's pretty amazing, let me see that. [crosstalk 00:13:18]. Cool.



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Every design that my students worked on was just absolutely amazing. This one is the finished parachute man, and then we have the very impressive grand piano. A giraffe, a boat, a ship, really cool. There's the crow, quite impressive.

I originally thought this one was a waiter holding a tray of food or something else but it was a man who wanted to show love and caring, he's holding up a heart. This one works as a cherry or a submarine but it's actually a submarine. I wasn't sure how this student was going to create a three dimensional name but she did. Here we have a city building, a flower, a beautiful tree.

All right, phase two, first level abstraction. We're fortunate enough in our district to have a lot of access to technology so it's not like it's a novel thing for my students, however creating 3D geometry in a virtual environment, they were highly engaged, much more than I actually thought they would be.

[crosstalk 00:15:01].

Speaker 9:

Your welcome. [crosstalk 00:15:20].

Using the 3D modeling, it really allowed my students to enter a, you know, whatever best fitting phase of learning modality for every student. It was, ... it was so enlightening to see that some excelled more than others however, everybody excelled in their own way and they created an advertent abstraction of their original 3D Lego model. The grand piano I thought was rather cubist looking. I really enjoyed seeing a lot of the dramatic perspectives that resulted. Here's our crow ... flying low. The name in 3D, pretty impressive.

Phase three takes us into the second level abstraction. The students will be painting what they created from their 3D virtual model representation. Notice that they're working from a colored printout of their 3D virtual model, not their original Lego piece, that one is gone now. We're in the second phase of abstraction, or the second level of abstraction and phase three.

Speaker 2:

[crosstalk 00:17:09]. Yeah I think so.



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Speaker 3:

Dude this looks really fat and chunky. [crosstalk 00:17:25].

Speaker 4:

It looks like medicine, right, it looks like medicine.

Speaker 6:

Oh yeah it does. [Crosstalk 00:17:25].

Speaker 9:

Oh I can barely tell what that is. [crosstalk 00:17:52].

Speaker 10:

I don't feel safe with him, sorry I didn't mean too.

Speaker 11:

How do you drop a paintbrush on somebody? He dropped a paintbrush on me.

It was really fun to see the different painting styles of my students. You can tell that some students were comfortable painting and some, just not as comfortable doing it, but they were having fun nonetheless.

Here's our finished parachute man, a very creative building, ... structure. Our man with a caring heart. This one is a bridge. This one was a maze. And here we have the crow showing a direct comparison with the 3D model. Next we have our rainbow, here's our ground level flower, and our beautiful tree. And our very cool grand piano.

When this student finished painting originally there was no background painted and I said, "Now are you painting everything that you see there because you're supposed to be?" And the student just looked at me like, "Oh, there's a background color on the computer screen, yep." So that's what it turned out, how it turned out to be.

Well there you have it, Brick Abstraction, what do you think? I would be very interested on hearing from you what you thought and how you might be able to use it in your





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classroom. You don't have to use Lego bricks, that just happens to be what I had and I have a lot of them. So ... how about this, use your imagination. Take care, bye.