

"Bringing the Lab Home"
19-19-19 COVIDeos Webinar Series
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Hello everybody and welcome to the IMSA 19-19-19 COVIDeo Series. It is 7 o'clock, so I'm going to go ahead and get started.

This is "Bringing the Lab Home: Interactive Simulations for Science and Math". We have three different interactive programs that were going to go through, so I'm going to try and get to them as quickly as possible.

Some housekeeping issues. This is being recorded, so everyone is muted and your video is turned off. However, if you

want to say something, go ahead and unmute yourself or you can feel free to type any questions you have in the chat box and they'll be answered following the presentation.

If you have any follow-up questions, I'm going to go through the simulations pretty quickly, so feel free to make a "Ask a Specialist" appointment if you want more clarification on any of the programs we talked about and the link is provided below.

Who is IMSA? The Illinois Mathematics and Science Academy is a...

residential high school in Aurora, Illinois and we are part of the Center for Teaching and Learning and we offer professional development sessions on math, science, technology, and pedagogy for teachers and administrators.

And that's what why we are bringing you this tonight.

Some learning objectives for the next

18 minutes.

Hopefully, you are able to add a few interactive resources to your toolbox.

We can discuss options to differentiate some of the virtual activities, which I know is a big struggle right now and we can talk about some assessment strategies for virtual math and science labs.

The three tools that were going to go through tonight are Phet, which is a math and science simulation program out of the University of Colorado.

Math and science of gizmos from explorellearning.com and ck12.org.

So I'm going to switch out and take you to Phet.

There are simulations in Phet in pretty much any science and math

area that you want to look at, so let's look at.

a

math example.

And here's an area model algebra program.

Now these are completely like free and interactive simulations. It doesn't have any kind of step-by-step walkthrough. You can see there's kind of four areas here explorer, generic, variables, and then there's a game.

For explorer, you can change dimensions of your area builder here. You can look at...

Make it show the areas. You can have it show your dimension.

You can change the total area.

And this is completely a area just for you to play around.

Ooh, just a second, OK?

Let me...

switch

stream here.

Is that better?

Okay, sorry about that. So let me know back.

This is what the Phet homepage looks like. You can pick what kind of simulation you want. I had just picked math.

I picked this area model . I's one of the first ones.

And it opens right in your browser and allows you to

kind of play around in a bunch of different areas. There's just Explorer. There's some generic like just with not looking at area with numbers adding and variables and then playing a game.

Do you are there all free you can use them however you wish. However, if you login,

it's free to create a login and click on this "For Teacher" section. There are some teacher tips. There's like little video walkthroughs and there are a bunch of teacher made

worksheets and kind of inquiry-based models that you can work look through and work through.

And there are plenty of simulations for math and science. Another one that

is really fun for like chemistry that I know I've used in the past is this reactant.

products and leftovers.

It takes kind of a complex topic of

chemical reactions and.

it makes...it puts an easier twist on it with a cheese sandwich. You can have two pieces of bread plus one piece of cheese makes one cheese sandwich.

So if I have eight pieces of bread and

six pieces of cheese that can make four sandwiches and I'm going to have

two pieces of cheese left over. And it's just a really good visual model especially when you switch to molecules and see if you have four hydrogen molecules and four oxygen molecules, you'll be able to make four water molecules and two leftover oxygens.

And just like...

Just like the other one there's always the "For Teachers" that kind of has its own walkthrough and pre-made worksheets that you can use that are in

Word or PDF if you want to alter them or send them to your students.

Okay? The next program

I want to go through is explorelarning.com and they have what are called Gizmos.

So you can get a free 60-day trial. This is a paid program however even if you do not pay

for it they always have a full list of

free gizmos and this changes quarterly. So even if you don't pay for it these are all of the gizmos that you could use for free right now.

But...

You can sign up and...

for a free.

60-day trial right now.

So, advantages for a trial are that you can create classes. So I've created a sample class here. It's really easy to create one. You just type in the name of the class. If I were

teaching

physics

I might...

do that.

And that's it. That's all you have to do to add a new class. So, I have my sample class and I've added a math Gizmo and a physics Gizmo.

You can search in the "find gizmos" by standard, by grade and topic, or even by textbook, so for these, I went through and I found a low grade math example and then a high school physics example.

When you find one that you want to use. Say that I want to use a middle school geometry on triangles.

These are all...

going to be my options. If you find one that you like, and you want to use you can just click "add it to class".

and that's

as easy as it is.

So I'm going to go back to my class my sample class and we can take a look at...

a couple that I looked at. This one's called Chocomatic.

It covers multiplication arrays in area.

For these, there is a

explorelarning.com worksheet that goes along with it. It's really great and they always ask

student some prior knowledge questions. There's always a warm up kind of getting used to if I click on the Gizmo. Kind of getting used to the different controls and things that they might need to use.

And then...

it always walks them through a few activities.

There are also...

If I go back, if you go back to the lesson,

there are, just like in Phet, there are some teacher made worksheets. If you kind of want to go out on your own or see what other teachers are doing.

But then you can follow along with the worksheets and it

Just like Phet is kind of like a little... almost like a game. For this one you design a mold for a chocolate bar.

So I'm going to have one like little tiny chocolate bar over here and then a big one. And then to pour the chocolate I decided what type of chocolate I want and then use enough to fill. You pick the number of squares.

There, it just did one square. If I tried to type in 50 squares,

it's going to realize that that's going to be way too many.

Okay, and then you can show the dimensions on there. And then when you wrap it,

it shows you the dimensions. And so I just work has students work through these another example.

that I have used before is "golf range".

My husband is an avid golfer so

We are

This is one that I've used in class just because it is a

a heavy interest in my household. Just like before, it comes with a worksheet of pre-made questions. You can create your own worksheet. I know this one it starts out with...

"try to get a hole in one".

So if you play.

it was too short. You can adjust the initial velocity and the angle.

and

if that's all it is. It starts out just trying to get a hole-in-one and have students

play around with it.

And then they work through a few activities.

You can show the paths of the ball. You can show the grid on a graph and there's a lot to go along with that one.

For this one, there also is assessment questions. There

And that is the difference between Phet and Explore Learning.

There are pre-made quizzes that go along with each one...

and...

If your students do these and submit it.

It gets tracked in your classes.

The last thing I want to talk about for the Explore Learning Gizmos is...

how to add students to your class.

If you my class roster is just Student A, Student B, Student C.

There are two ways you can do you can add students to your class.

If

you already use Explore Learning Gizmos or your students already have accounts, you have a class enrollment code up here in the corner.

And you would just give them that they would type it in and it would be enrolled in your course.

If your students have never used this before or maybe they're younger and.

kind of like you wouldn't want them to make their own username and password.

You would just type their name in. It makes a username for them

and a one-time password so you could email or verbally tell the students their username that you created for them and their password.

And then they would use that to log in and create a new password for them.

Okay the last...

thing that I want to resource, that I want to talk to you about is ck12.org. This one is a little different. It's not just interactive labs.

It is...

nn online textbook survey.

But it's much more than textbooks.

So, kind of like ExploreLearning you can create classes.

So I created a sample class and just like before.

they give the class code if your students make their own accounts or you can...

assign students

to the sample class.

So how this works...

is you can search their repository of information

and create your own textbook and interactive activity.

So what...

I had gone through and said I wanted to teach DNA and protein.

through my sample class.

So I in "What do you want to learn today?" typed

"DNA and proteins" and I found a couple of things that I thought my students would enjoy.

DNA to RNA to protein.

[typing] DNA and proteins

So what I did was I just type that in and it gave all of these examples. And it tells you if it's a video if it's like when it says read it could be a chapter from a textbook or an article or something like that. There are also up here it said "plix".

Plix are interactive labs just like we already have looked through.

So if I wanted to add this one I could click on it.

to play around with it.

It's asking me to do like some labeling here and then it asked some challenge question. So, if I liked that activity and wanted my students to do it,

I could add that to my sample class.

You might have seen too...

It's also integrated with Google Classroom so if you're using Google Classroom you can assign it straight through Google Classroom.

And so that's an example of a "plix"...

interactive. There's lots of videos

and articles as well. You can also create your own textbook

by piecing things together. These are ones that I had used in the past in my biology classroom where I just put reference articles for my students...

to use all together that I kind of pieced together into this what they call a FlexBook.

I'm going to go back there's one more thing...

I want to show.

These are articles I had assigned classes.

At one point or another, you can also, this is a really good spot for accommodations because you can highlight and take notes.

And you can also create different versions because it is an editable text.

You can make different versions for different students.

So if I wanted some students to specifically have highlighted information or if I wanted to write in a note.

I can do that.

So, maybe like I wanted to say to them but say to them "...watch

this video and then add in a link to a YouTube video that explains it better or something. I could do that and the students would do that as well.

Okay so let me...

go back.

and make sure...

So those are our three tools for interactive simulations: Phet out of University of Colorado, Explore Learning Gizmos and ck12.org.

The location of this presentation is at www.IMSA.edu/events.

And there is also an attendee survey

and

you can type that link in and you'll just have to specify that you attended the "Bringing the Lab Home"

Webinar.

My name is Cassandra Armstrong. Again, I'm a curriculum writer and professional development specialist at IMSA. If you have any questions at about this presentation or about integrating science and math

at all during you know during the Covid crisis, feel free to make an "Ask a Specialist" appointment with me at IMSA.edu/educator-development/e-teaching-resources

Please join us for the upcoming 19-minute webinars. Tomorrow we have "Making Use of Chrome Music Lab". In two days, "Making Your Lessons Biteable with Short Animated Videos" and then Travel the World through Flags: Desmos, Equations, and Inequalities".

Thanks!