Hello, and welcome to Shifting the Focus: Augmented Reality Engaging Learners. I'm Christine Lion-Bailey, the director of technology and innovation in the Morris Plains School District. I'm excited to be here with you today to talk about augmented reality. If you'd like to connect with me on social media, please follow my Twitter handle @clionbailey.

Emerging technology is a collection of tools that can be used to engage learners in today's classrooms. Emerging technology can encompass virtual reality, mixed reality, game-based learning, augmented reality, and so much more. This particular session, we will focus specifically on the use of augmented reality, and I will provide you some real-world examples of how AR can be used to engage your learners.

Oftentimes, people are confused by what augmented reality means. Most people are comfortable or understanding of virtual reality, but augmented reality tends to be more of a gray area. For the sake of today's presentations, augmented reality or AR is defined as "a technology that layers computer-generated enhancements on top of an existing reality in order to make it more meaningful through the ability to interact with it." In other words, it's taking an image, computer-generated, and laying it on top of the reality in which you currently exist. It does not replace the reality. It simply enhances your reality, allowing students to explore objects that would otherwise not be accessible to them.

We are going to explore two different types of augmented realities today. There are three, the third being location-based, and a primary example of location-based augmented reality would be the popular game of Pokémon Go. In Pokémon Go, teenagers or adults would walk around with their device, and based upon their geographical location, augmented reality images would appear on their screen. That is an example of location-based augmented reality.

For the sake of today's presentation, we'll be taking a look at target-based augmented reality and device-based augmented reality. In target-based augmented reality, there's a specific target that the device must come in view of to trigger the augmented reality. On device-based augmented reality, the augmented reality is triggered through the device and not connected to a specific target.

Some popular apps that are used for augmented reality in education are CoSpaces, Expeditions, Metaverse, Catchy Words, and the MERGE Cube apps such as Galactic Explorer and others. For today's presentation, we will be taking a look first at Catchy Words, then at Google Expeditions, and lastly, at the MERGE Cube app Galactic Explorer.

We'll start our journey by looking at Catchy Words AR. Catchy Words AR is a device-based augmented reality experience in which students are able to practice letter blends and spelling conventions, identify vocabulary words by pairing them with a picture prompt, translate vocabulary words into a foreign language of study, practice word tenses, and so much more.

This app can be used not only to enhance a language arts-based classroom, but also social studies, science, math, foreign language, or anywhere where vocabulary or lingual studies are important aspects of learning.

One of my favorite examples is using this in a foreign language classroom where you're translating words from English into the language of study either by using picture prompts, verbal cues, or any other method that is most effective for your students. We're now going to take a look at how Catchy Words works through your mobile device.

First, we're going to explore the Catchy Words AR experience. If you'll notice in my menu here on the left-hand side in the middle is the icon for the Catchy Words AR app. I'm going to open it. You'll notice, I'm actually standing outside right now, that it's telling me to find the bubble. If I bring my phone over to the bubble and I now walk toward the bubble, I am going to pop it with me phone. Once I pop the bubble, you'll notice that letters are floating around in the air. I'm going to now use my phone like a magnet, and I'm going to catch the letter, and I'm going to bring it down and stick it in one of the boxes.

I'm going to do the same thing with the other letters. Now I have two more letters. If you look on the bottom-right of my screen, you can see that the letters that are in the wrong spots are red, but the letter that's in the correct spot is white. I'm going to take my S, and I'm going to move it over here. Oops. I move it over here. That must not be the right spot, so let's put the S there. Okay, that's correct. Now I'm going to move A.

There's my other letter. For a kinesthetic learner that likes to move around, this is a really great [crosstalk 00:05:47]-

Speaker 2:
Whoo. Yay.

I spelled the word correctly. The word is "base," and now we're celebrating. In the bottom-left corner of the screen, it tells me that it took me one minute and two seconds to complete it.

Now if I want to do a new game, if I click my plus sign in the top-right corner, I can actually enter my own word. Let's pretend that I'm in a Spanish classroom, and I'm teaching the students colors. I'm going to enter "verde" as my word, which is green in Spanish. Now I'm going to tell my partner, I'm going to hand them the device, and I'm going to say, "How do you spell green in Spanish?"

They're going to pop the bubble. Then they're going to go and find the letters. They're going to put the word together so that they're spelling "verde," and so they are practicing the spelling and the translation of the language of study through the Catchy Words app, so if I put my letters into their positions, and I'm spelling "verde." You can do this anywhere, so you could take your learners outside to do this. You can bring them back inside the classroom. They could practice at home.

Speaker 2:
Whoo. Yay.

The app is free. It's engaging, and it just makes learning fun.

The next type of augmented reality that we're going to explore today is Google Expeditions AR. Google Expeditions is well-known as a virtual reality tool that can be used to explore locations all over the world through Google Cardboard and other types of virtual reality equipment. However, a very little-known fact is that Google Expeditions also has an entire AR or augmented reality component where you can take images of all sorts of areas of study and bring them directly into your learning environment.

Some examples would be the study of various species of dinosaur through observation. Using the Google Expeditions AR app, you can have different types of dinosaurs appear right inside of your classroom, and you can have your students study those dinosaur species looking at their physical characteristics as well as learning key information from the little info cards that come along with each scene in the AR experience.

You can also assess the power of a variety of weather phenomena, like having volcanoes and tornadoes appear right inside of the classroom and studying the impact and the force with which they take place. There's another experience where you can experience da Vinci's various inventions making valuable connections to the engineering design process as well as identifying modern-day tools and resources we have that are directly linked to those inventions.

The possibilities are limitless with over a hundred different AR experiences available through the Google Expeditions app, all of which are free for use. We are now going to take a look at two examples of Google Expeditions AR, one that aligns with sciences and another that aligns with humanities.

Now we're going to explore the Google Expeditions AR app. I'm going to open the Expeditions app on my phone or mobile device. If you look on the right-hand side of the screen, it's in the top corner. Once I get into Expeditions, you'll notice that a whole bunch of information pops up, and in that menu, you can see the different experiences. They say either VR or AR. For example, you have da Vinci's Inventions AR, Dinosaurs AR, Instruments AR, et cetera.

We're going to explore the dinosaur one. If I open the dinosaurs, and I click View in AR, you'll see I'm now in my environment. I'm actually in the nurse's office because who doesn't want to see a dinosaur in the nurse's office. If I wave my phone around in this one area, let's get a little closer, we're going to have a spot appear where we'll be able to have our dinosaur arrive. If I wave my phone around a little bit. Sometimes it takes a minute for the app to find a good spot to put the dinosaur. Maybe we need to get a little closer. There we go. We want to put the dinosaur right on the cot.

If I tap there with my finger, there is our dinosaur. You can see, he clearly wasn't feeling well today, and so he has come to visit the nurse. He's just waiting patiently on the cot

for the nurse to come in. You can see that we can explore this dinosaur. If we swipe up from the bottom of the screen, we can actually get some more information about what species of dinosaur he is. This is just another great way to have students explore different objects of interest by bringing them into their actual environments.

I'd now like to take an opportunity to show you another Google Expedition that aligns with humanities. If I go back into Google Expeditions in my AR/VR apps menu on the upper right-hand corner, once it launches, you'll see that I have the ability to search, which I did not show you before, for AR experiences in Expeditions. If I click on that AR button on the top-left, it will launch a menu of all the different AR experiences that exist in Google Expeditions for me to choose from.

The one that I wanted to show you today is the Art History: Impressionism. If I open the Art History: Impressionism, you'll see that it gives me some information about what Impressionism was in terms of an art movement, tells me a little bit about the practitioners and the style of art, and it tells me what I can expect to see in this particular AR tour.

If I click on View in AR, it will launch. Once again, it's going to look for a place where it can put my object. I'm going to tap the circle to place the object. The object will appear. You'll notice that this is a piece of art by Renoir. I can actually pull up this information card, and it will give me information about the particular piece of art.

Now, rather than taking my students into New York City to The Metropolitan Museum of Art or wherever your closest art museum is, I can actually bring the art museum right into my classroom. I can approach the painting and get closer and lean in, and I can look at the fine details on the different people in the painting's faces. Then, of course, I can always zoom back out again. I actually walk around the painting if I wanted to. There isn't anything on the back, however, it's an option. I can use my fingers to pinch the screen so that I can zoom in and zoom out on the painting.

If I wanted to, I could look at the different paintings in this particular collection, so I could scroll over to the next piece of art which is going to be Water Lilies by Monet. You'll see that I can look at this piece of art, and I can zoom in. I can scroll the piece of art, and I can zoom back out. I can pull up the information card to get more information on that particular piece of art.

Some other art that's in this is the Houses picture in autumn. I can zoom in and zoom out on this piece of art as well. It's just nice to be able to bring the artwork right into the environment where students can study the art. A few more, Paris Street, Rainy Day. You can make connections to math, to science. You could use this as a writing prompt in a language arts class, an observation piece. In a foreign language class, you could use it to have students tell you what colors they're seeing, maybe what the season is like, the type of clothing that people are wearing. There's ways to connect art to every content area through true arts integration. This is just another great way to bring art right into your classroom.

As I had shown you before, there are numerous AR experiences that you can choose from in Google Expeditions. You can choose any one of them. It is completely and entirely free for use. It gives information about all the different things that you're looking at, from fashion to corals to DNAs, da Vinci's DNA, da Vinci's invention, so on and so forth. You can also search, so if I wanted to search things that are related to Egypt, maybe I'm a social studies teacher, it will give me all the experiences that are related to that particular topic.

I really hope that you're able to find a way to use Google Expeditions AR in your classrooms. You can always mirror this to a screen in your classroom, so if you have a SMART Board or an Apple TV, there's ways to mirror your phone directly to them. You can also connect your phone to your laptop device and mirror it that way as well. Again, I hope you enjoyed learning about Google Expeditions AR, and I hope that you'll find something that complements your classroom. Enjoy.

The third and final type of augmented reality that we're going to look at today is Galactic Explorer, which is a MERGE Cube augmented reality app. A MERGE Cube is a small foam block that fits in that palm of your hand that has codes on each side of the cube. Those codes are triggers for this trigger-based augmented reality. When using the Galactic Explorer app with a MERGE Cube, if you hold the device over the cube and bring those symbols into view of your camera, the cube transforms into a solar system.

This is an excellent way to teach students about the orbital planets in the solar system as well as explore individual planets and their celestial bodies. The MERGE Cube is a

great way to bring the learning directly into the palm of your student's hand. Galactic Explorer is a free app available for use with MERGE Cube. However, there are many other apps available for MERGE Cube that are both free, and some are paid. Let's take a few minutes and look at an example of how MERGE Cube can be used with Galactic Explorer.

Now we're going to explore how Galactic Explorer works with a MERGE Cube. On my AR/VR app menu in the upper right-hand corner, you see... I'm sorry, the upper left-hand corner, you see the Explorer app. I'm going to click it to open. You'll see it's loading as a MERGE Cube app.

Once my screen appears, Galactic Explorer will start to load, and I'm going to choose Phone Mode. You could choose VR Mode if you had Goggles that go with a MERGE Cube. However, I don't, so I'm going to use the Phone Mode. By clicking the Phone Mode, you can see that it now says I should scan my MERGE Cube.

If I bring the MERGE Cube into view of my camera, the cube turns into the solar system. You can see that I'm able to rotate the solar system, thereby exploring where the planets line up in orbit around the sun. I can also bring my device closer and further away, and what I can do is I can tap on individual planets within that orbit to zoom in on them. I'm going to click on the Earth right now. Now, the cube turned into Earth. We can see in the viewfinder that we have the moon, and we also have our satellite.

If I hold it perfectly still, you can see the Earth rotating, and so you get an idea of how Earth rotates and where things are in relationship to it. I'm also able to click on this I for information, and facts will pop up that are related to the celestial body that you're looking at. I can click back out to my solar system, and I can turn it and look at it from all different angles.

I can click on another body. I can go into Saturn. I can do the same thing with each individual planet that I can do for the solar system as a whole. Again, clicking on that information button to gather more information about the planet that I'm looking at. You can see how its orbit works and how the Saturn's moons and rings revolve around it.

Another neat feature about this app is that upper right-hand corner, I can click on that little camera record icon, and what it'll do is it'll actually record me as I'm navigating through the app. This is a great way to assess students on their knowledge of the solar system where you can have them old the solar system in the palm of their hands, and they can explain where each planet is in relationship to the sun, and then a few facts about that planet. It's a great alternative way to assess a student's knowledge about the solar system. If I click that record app again, the record button again, it will stop recording. I'm also able to shine a flashlight, so if I was in a darker space, I can turn the light on and off, and there's a few other options as well.

That's Galactic Explorer. It's just a fun way to hold the solar system right in the palm of the student's hand. As I had mentioned earlier, there are several different apps that you can use with the MERGE Cube. Some are free. Some are paid. Depends upon the experience, but they all use the app as a target-based AR or target-based augmented reality where the cube is the target, and it interacts with the app on the phone. I hope you enjoyed learning about Galactic Explorer.

This concludes our journey through some augmented reality or AR apps that you can use in your classroom. Just to recap, Catchy Words AR is a great, free resource to for exposing students to vocabulary, spelling conventions, translation, and any type of unit of study when you can incorporate words, spelling of words, or any type of vocabulary. I hope that you'll find uses for it, regardless of what content area or grade levels you teach.

Google Expeditions AR was the second resource that we looked at, and it has over a hundred different examples of things that you can bring into the classroom and put right in front of the students in an environment that would otherwise be impossible. It eliminates the physical borders and boundaries of learning by allowing students to bring Renaissance-era paintings into the classroom, dinosaurs from different time periods, inventions from famous inventors. The list is limitless. Your imagination can take you anywhere with Google Expeditions AR.

Lastly, we took a look at the MERGE Cube and the Galactic Explorer app that accompanies it. Along with many other apps, you can have MERGE Cube transform into a variety of different tools, resources, or units of study that can be placed right into the palm of your students hands where they can explore their learning and come up

with new theories, ideas, and supporting arguments that surround important learning that's taking place in your classroom.

I hope you've enjoyed our AR journey today, and please reach out to me via Twitter @clionbailey and let me know how augmented reality is transforming your learning space and engaging your learners. Thank you very much for joining me today, and I hope you've enjoyed the presentation.