So, let’s get started right now. By welcoming our speaker, Sara Larkin, a consultant for Iowa education services for the blind and visually impaired. Formally, she was a high school teacher in general education for 18 years. And though she worked one-on-one with students from the Iowa educational services for the blind and visually impaired, you may have known them as the Iowa braille school, she was not directly related to education for students with visual impairments until much later in her career. She has taught abacus, Nemeth, audio graphing, T-184 and will talk a lot about those objects. I also want to mention that as well as being a frequent presenter on the topic of accessible math and science teaching strategies, Sara turned us on to Fosweb.com, and I know that she will talk about that as well. The Full Options Science System, a regional-based concept for grades K through 8, it was developed at the Lawrence Hall School of Science at the University of California University. FOSS is an ongoing project dedicated to improving the learning and teaching of science. Welcome to Perkins, Sara.

[SARA LARKIN]Thank you, very much. I appreciate you having this. So, on the second slide, I’ll just quickly review the goals which were included when you registered that talk about what we will be covering today. And this includes identifying strategies, choosing materials that can be used, recognizing when accommodations may need to be made, and of course, identifying ways in which inquiry-based learning can be used to help these students that are blind or visually impaired understand the concepts of magnetism, electricity and sound.

Many of the ideas that I will be going over today actually came from the FOSS kits as mentioned. I have included the website for you that is Delta Education. There are still a lot of materials that are available through the Lawrence Hall school of science where there are kits for students who are blind or visually impaired and what is nice about these particular kids is they do use a multisensory approach. So that the students don't have to rely on just one sense. We know that math and science are very visual subjects, so what’s nice about these FOSS kits, is that they do allow the use of all of the different senses.

On the next slide, I included the two links for the ones that we’ll be looking at today. The first is on magnetism and electricity. And the second is for physics of sound. Now, one thing I would like to mention is, even though you can get the full kits , many of the items in the kits are actually things that you could just get around the house. So, you really wouldn't need to have the kits or the full kits to be able to do many of the things that I’ll be talking about today.

We are going to start with magnetism. And the first lesson, lesson materials, that we are going to look at include test objects. Because, with inquiry-based learning, we like the students to explore the science. And so, the first part of magnetism, we're actually looking at using a lot of different items , which again, are just things from around the house, things like nails and straws, sponges, rocks, pebbles, different fasteners, yarn, craft sticks, so, this isn't a specific list that you need, you would just want a combination of items where some are magnetic and others are not. And then all of those should be mixed together in a bag or a container for the students. And we also want to make sure that there is some sort of a container that either has two sections or maybe two separate containers or a cookie sheet, just because there is a lot of objects, it's helpful to keep them in a contained area. So that if students are having to get close or feel around, that those items won't move as easily for them.

It is important to have a list of what these items are for the students. And what each piece is called. So, I always go through the list of those items with the students, because they may or may not have run into them in their daily lives. So, we just want to make sure that they know what everything is called.

So, in this investigation, students are asked to use that set of test objects and we actually are going to go through a series, we would have them go through a series of investigations within it . Again, following the inquiry-based model, we want to make sure first that we just have them guess which object they think will stick, and we just start with the words stick or don't stick, and then can actually get into the terms of magnetism.

So, guess which would stick to the magnet and which don't? And then we would ask the students to actually test them, and that's why we want either a container with two sections or two containers so that they can easily divide up those into the two sections: those that stick, and those that don't. And then, we want to talk about why certain items stick or don't stick. To look at the whole idea that the only ones that are going to stick to magnets are those that are made of some sort of iron or steel. Some of the ones that are very misleading is its great if you have aluminum nails and steel nails, because both males tend to feel the same, but, the aluminum ones will not stick to the magnets like the steel ones do.

And then, we actually will take the magnets around the room or around the schools, so we can also include some orientation and mobility while we're doing that, but we're searching for things around the room that also would stick or not stick. So, this is a great way to, even bring places in the room to the students’ attention that might not be obvious to the student as even having been there. For instance, there is your vents that are often magnetic and a lot of times, the students don't even think that those might be there, or they could use the door, the door knobs and look at which things are magnetic versus not.

I have a couple of pictures of our students doing this particular lesson. So, these justice of the items that I gave him, noticing both the pictures, the students have a list of the items next to the objects. In the upper left are some low vision students who just have them laid out on the table and they just are dividing them between two containers, where the lower right are a couple of braille users so they make sure to contain them within a piece has two different sections.

Items for the second lesson include the Foss balances, a magnet on the post or dowel, some large washers, spacers, which could be a variety of things, usually plastic, something that is not magnetic, I used little plastic poker chips. And then, we want them always to have a paper or note-taker or Perkins brailler always available because as scientists, we make sure that we want to record everything that we are finding. What are the qualities that we are figuring out as we are going to the different lessons? So, they should be recording this as they work through the lessons. And then we also want them to have some graph paper and then of course tools to mark with, which could include items like stickers, maybe bold line markers, they might need a CCTV as well, if they need to enlarge the sheets that you are working with. For instance, the graph paper that we will be using.

So, I'm actually going to hold up some of these pieces . This is an example of the FOSS scale, it's just a blue scale. It has room for cups at both ends of the scale, and then there is actually --- this is just a dowel, and I glued the magnet on top of the dowel. And what is nice about a lot of the FOSS kit pieces is that they have a place to stick stuff. So that it isn't going to move around on them. So, these particular scales have a section at the bottom of the base that that dowel fits right in it. So that way, the magnet is just going to stay straight up.

Now, but I also have our couple of plastic cups, one of the plastic cups doesn't have anything in it, and the other one has a magnet that is actually glued to the bottom of the cup. And so now, when I take this scale, and I'm going to move back a little ways, when they take the skill, I'm going to put my magnets cup right on top of the side that has the magnet with the dowel and immigrants put the empty cup and the other side. And, with the students are going to do is they're actually going to add a washer at a time until they can get, and they're going to count these they're going to go until they can get the actual balance, the force of the magnets to break. In other words, they want the magnets to actually come apart.

[LOUD CRASH] And you heard it. So, that's exactly what will happen with them. They will hear when that breaks. And I like to place that just on a cookie sheet so that again, when those do come down, they'll have a place that it will be contained. Now, the next part of the investigation is, they will do the same sort of thing, except, I'm just going to take a plastic poker chip and I'm going to place it between the two magnets. So, I'm just placing the spacer right between the two magnets. So now they're going to do the same thing, they will put the washers in the other side and they're looking for that to break again. And then they're going to add 2 spacers and see how many does it take to get it to break with two spacers in between there. And with 3, and they're going to keep track of this data as they work through the lesson. And so, then, they will be able to graph on either large print or dark print or tactile graph paper the number of spacers on the horizontal axis and a number of washers that it took to break the force on the vertical access.

So, here we have a few students that are actually working on the investigation. And you can see in number left, that we have a student working on their notetaker , keeping track of recording what their particular group is getting for the number of washers that it is taking, and same thing in the lower right, that particular group has already put a spacer in, and so they're testing can to see how many washers it takes this time.

The next slide shows a student actually doing their graph again with spacers on the horizontal access and the number of washers it takes for the vertical access. We can talk about, based on the number of washers it took, they may have to count by something other than one. In fact, it's likely that they're going to have to count by something other than one so we are able to talk about scale at the same time.

Materials for the next lesson. This is the third lesson, is going to include just some basic boxes. You want them to be relatively thin boxes, even the ones that shirts, and a lot of times from stores, those plain white thin boxes were smaller ones of the same, and I always put a magnet (if you wanted to be more challenging, you could put more than one magnet) and tape it to the inside of the box and then make sure the boxes taped shut , and then you want a set of items that are magnetic, and then some tactile stickers or something to Mark or draw with .

During this particular lesson, students should actually take those magnetic objects that they found in the first lesson and they're going to drag them around the outside of the box, so they're not to open up the inside or see where the magnets are located, but they're supposed to use the magnetic objects from the outside to find out where the objects are located. And the students should explain how they know the magnets are there, they should explain which devices worked best for detecting it, and why they think so. Why those the best way to detect it?

I always encourage the use of questions that involve why a lot because I want to stay away from those yes/no questions which give me a 50-50 shot. Other types of questions are going to give me a better idea of what the student is really understanding.

Those are a few lessons concerning magnetism. So, the next part is some lessons on electricity. For many of these lessons, I used the D-cell batteries and then FOSS actually has D cell holders, circuit bases and switches. They have motors. I like to use wires with alligator clips because they are easiest to work with, but sometimes I'll just use the bond-stop clips as well. We are going to talk about using rivets with some washers and a steel strip, to actually make a telegraph at the end.

So, some of these earlier ones lead up to making a telegraph so that we can actually send messages from one student to another. What's nice about all of these particular items is -- now these will not be found, probably, around your home. But, what is nice about them is they help contain the pieces that the student is working with. Because there is a spot for the battery so that the battery is not rolling around. In the circuit base that you see in the upper left-hand corner , there is the battery holder . In the upper left of that base is actually a place that the motor just fits right in the circular area. The middle section allows us to put a switch in that place , and this particular one has bond stop clips, and in the upper right of the picture, there is a rivet with some rubber washers on it. Again, those rubber washers will fit really nicely into this base to help contain the rivet. The motor has the wires already attached to it. So, there's not as many wires for the student to keep track of. And there are additional D cell holders. What is nice about this is again, I can do a series or parallel circuit using additional D cell holders and I don't have to worry about those batteries rolling all over the place. And then the lower right part of the picture is a switch that allows me to complete the connection or to make an incomplete circuit.

So, this particular lesson actually has three parts to it. It's really trying to make the motor run, trying to figure out how I can make another run. Again, with the inquiry based , I'm not going to tell them how to make it run. I'm going to have them mess with it. So that they remember it better.

Students use the circuit base to actually build a circuit with only the D cell and the motor to start. Once they have that working, they're going to add a switch to the circuit , and then the third part is actually teaching them how to make schematic drawings of those circuits that they have created. Because drawing is part of it. But, we will talk about some of the accommodations for those drawings because some students don’t have the fine motor to be able to make those drawings.

I have a couple of pictures here of the students that are working just with the battery and the motor. The student in the upper left is actually trying to touch the sides of the battery and it is not going. He does eventually get it, and it doesn't take too long, because they just start touching different parts of the battery. And in the lower right, we have a couple of students that are touching the opposite ends of the battery with the wires and their motor is running.

What I like to do is talk about a way that I can make that sound louder , and an easy way to do that is to just put a masking tape flag, just put a piece of masking tape and fold it in half over part of the mother the term and that flag will actually spin around as the motor is running which means the latter, easier to feel, and easier to see.

The next slide I have a picture of a couple of students that have added their switch, and you can see on the base how nice it is to have all of those pieces contained. Because it makes it easier for them to actually put the wires in one at a time and connect it one piece at a time without things moving on them . There are also two holes in this space and I have tied a string to those two holes, because in the next part of this, the next lesson, is finding insulators and conductors, so that the students can actually hang this entire base around her neck by a string, and can walk around the room and try to complete a connection to see which materials are actually insulators and which are conductors.

So, the students are going to build their circuit so that two of the wires are going to be open, and they’re going to search from the classroom for insulators that would actually not allow with the motor to run for conductors that will complete the circuit and allowed the motor to start. And then you can talk about what you notice that is similar about all the conductors and this goes back to the fact that they are made of iron or steel. And what can you say about the insulators? So again, I'm avoiding those yes/no questions.

As we start talking about completing circuits, I like to use mystery boards that I actually make. I just take pieces of cardboard and fold them in half , and on one half, I have put brass fasteners through the cardboard , and then I'm able to attach wire between any two fasteners or maybe multiple fasteners if you want them, more wires you connect up, the harder it's going to be for them to get the entire circuit. So, depending on the student and how challenging you want it to be. And then we are going to have pictures of those four brass fasteners so that the students can then draw using wiki sticks or graphic arts tape or markers, they can actually draw where those wire connectors are that allow them to complete the circuit.

And we can talk about the wires and how those are conductors and that those wires are hidden somewhere between the two layers of cardboard and it's up to the students to find it. Again, I taped the whole edge around because I don’t want them to see it, I want them to use what they have learned to figure where those wires are located.

In this lesson, the students are going to work with those mystery boards to reinforce the concept of a conductor and to check their understanding of how electricity flows through the circuit . They are still using their base unit with their motor and their battery to do this particular activity as well. And, the students are going to find those wire connections, some might draw the pictures from scratch, others might use the wiki stick, graphic arts tape on the tactile graphic, or some may just draw right on the box, they can lay the wiki stick right across the two fasteners or put some graphic art tape across the two fasteners. That are connected by a wire.

In the fourth lesson, they start building an electromagnet. The students discover that when current flows through an insulated wire, that is wound around a steel core -- that is the rivet, the steel core that we use. But, that a steel core becomes a magnet itself. And, they find out where to wind the wire around the court to produce the strongest magnet and they're actually going to do some experimenting, so they are going to wind it first around the rivet 20 times and see how many washers they can pick up with that electromagnet. And then they're going to wind it 30 times and count how many small washers they can pick up with that same electromagnet. And then 40 winds and how many they can pick up. And that way, they can do a graph again on the number of winds on the horizontal axis with the number of washers they can pick up on the vertical axis.

Here we have students actually working on picking up their washers, so they have wound the yellow wire around the rivet , that 20, 40 or 60 times, and then actually try to make a prediction as to what is going to happen if they wind it, let's say 70 or 80 times. How many washers do they think they can pick up? And then they check the prediction to see how well they did. And then we are able to use that electromagnet to actually invent a telegraph, and this is actually a working telegraph. We connect two students together so that they can actually talk to each other . The students apply the knowledge that they learned in building that electromagnet to build the telegraph and the actually invent a code and you use their telegraph to send messages to each other through that telegraph.

So, I have an example of a couple of students that have hooked up their particular electromagnets together. There is a long wire between the two students that goes along the floor . I have had some students where this is a little more challenging for and then because we have practice with the schematic drawings, I'll actually give them a schematic drawing of the telegraph and have them build it from there. If they needed a little bit more assistance with that piece.

And the final part is sound. And that is another particular FOSS kit called physics of sound. And that is where I'm getting a lot of these particular lessons. Materials for the first sound lesson include the drop chamber with a vision barrier and the vision barrier is just a piece of cardboard with a couple of slits in it that go over a piece of poster board that is in a circular shape. And that way, when students are dropping, even if some have some vision, they are not able to see what is being dropped.

And through this particular lesson, we will also want different types of objects that make different sounds when they are dropped. And I like to use sorting trays. You can use muffin tins , cookie sheets, and we're going to use some letter stickers to make a code that we can send from one student to another.

So, this particular one has two parts. It has the drop challenge, and it has the drop codes. In the drop challenge, the students explore their ability to discriminate sounds. They listen to the sounds that the objects make when they are dropped . They try to figure out what objects are making those sounds , and they even can do sound matching where one student is going to drop an object, the opposite student will try to drop the same objects, and when they look under, they are able to see if they dropped the same object or not, and then they start matching objects and then they can make a code. The students actually set up a letter to correspond to each object and drop the object in a series to send messages. We start out with words, some students even go on to work with sentences where an object represents a space. I even use the muffin tins or the sorting trays so that the students can put those letter stickers right by the object . And I use the letters in the word stream, S T R E A M, because those are the letters most commonly used in words in the English language. And so they might set up a piece of cardboard that is the letter S, the spoon is the letter T, a poker chip is the letter R and so forth so that they have an object for each of those letters and can drop them in a series to send messages for communication. It's part of the next-generation science standards include actually being able to send messages using sound and electricity.

Materials for the second lesson include tuning forks and with those tuning forks, we are going to use blocks of wood , cups of water, pieces of paper or cardstock and the ping-pong ball on a string , a FOSS tone generator and some beans , and you'll get to see some of these pictures of them being used. A door fiddle --- the door fiddle is actually just a long string and it has a wooden wheel at the end of it and the wooden wheel goes under the door and then the string just wraps up the door and around the back of the door and then back up to the handle so that it becomes really tight and that way you can put a piece of wood in there and you have a little door fiddle, almost like a guitar with a single string.

And the long gong that is pictured is just a piece of wire that is connected to a string and at the other end is a plastic cup that the student is able to put by their year to listen for that vibration. So in this part, we are just focusing on vibration . I will show you a couple of these. We have some students working with water and the next slide. So as they touch the tuning forks to the water, it'll actually splashed up towards them so the vibration moves the water and causes that water to splash. With the ping pong ball, all it is is a ping-pong ball that has some string taped to it . So I’m just going to hold that dangling, I have a piece of wood, and I have a tuning fork. I'm going to strike the tuning fork on the wood and then hold it close to the ping-pong ball and the vibrations are actually moving the ping-pong ball on its own. So again, it shows the vibrations and how that makes it move. And the nice thing about it is even if the student doesn't get right by the ping-pong ball , if they move it around, just slightly, it doesn't take much for it to move that particular ping-pong ball.

Same thing with a piece of paper. So, I just have a particular piece of paper or card stock and strike it and it makes a buzzing sound on the paper. And the students are able to actually feel that paper vibrating as well. So again, we are focusing on the vibration that is happening. As the students pluck the string on the door fiddle, they feel that that string is vibrating. As they actually tap the wire that is hanging from the string, they hear the vibration through the cup. And, on the tone generator, the beans will actually bounce up and down on the tone generator. As the volume and pitch changes , that vibration changes.

So, on sound vibrations for this particular piece, the students are actually exploring that production of sound with the door fiddle , the tone generator, the tuning fork and that long gong; and they are focusing on the sound source , which are things like the tuning forks, the door fiddle, the long gong; they are identifying the sound receivers, (which would be their ears), and they compare the sound volume to the vibration intensity . So if they tap the tuning forks really hard to make them really loud, they even get bigger splashes through that water because their vibrations are going to be bigger.

All right, that's materials for the lesson on vibration and pitch include tongue depressers, and that tone generator and door fiddle again. So, students can actually just take the tongue pressures on the edge of the table , hold their hand on one end of it, and pluck the other end. And what they want to do is then look at what happens when they change the distance that that particular tongue depressor is over the edge of the table . If it's short, what happens to the sound? If it's a long ways off, past the edge of the table, what sound does that make? And with the door fiddle, I'm able to move that piece of wood up or down to make the strings shorter or longer and look at what that does to the sound. And that is where we start talking about how becomes higher or lower so that your shorter length is going to give you a higher pitch and your longer length is going to give you the lower pitch. Which, you can have a nice connection to music in some of the musical instruments , such as the piccolo being very short and having a very high sound compared to a regular flute, or a pace which is a very long , having a very low sound, compared to a violin.

For vibration and pitch, I also have the students just touch their throat and make high sounds and low sounds to feel the difference in the vibration, between that high and low sound. They look for evidence between evidence that different vibrations produce different pitches and sounds, and then we go back to that door fiddle and tone generator again to reinforce those concepts. The materials for the lesson on length and pitch include water phones , xylophone tubes and a mallet , a kalimba, which is just little metal pieces between two pieces of wood, and a string bean. And you'll get to see these in the picture that I have next. So the water phones: I have water at different levels and the students are trying to put them in order . Now, for those students that can't see , we want to do also is just smart for the water levels are because we want them to have an idea of how that water level affects the pitch . So, I just use graphic art tape at the spot on the bottle where the water level is. And I just wrap it around the bottle at the height of that water level.

The girl in pink is using the climb the, which just that:, those little metal pieces, as they make the metal strips short, on the side they are plucking, they are going to get a higher pitch as they make the metal pieces long on the side they are plucking , they're going to get a lower pitch. And then, the bottom picture is the string bean. The string bean is just a half of the yardstick or meter stick and then I have binder clips that are holding string across the particular yardstick or meter stick and then I have a paper cup that is between the string and the yardstick or meter stick. And then the students are able to move that cup to make the strings shorter or longer so that when they pluck them, the pitch changes. And the real focus here on those is, again, that length being the determiner of the pitch.

The next lesson has to do with tension and there's a couple of other instruments that we use to talk about tension. One is called the mini gut bucket, and the other is the FOSS Ulele. These are just words that FOSS came up with, they aren't real instruments, but the kids love the names of them. The mini gutbucket is what you see at the end of the picture which is a plastic cup which has a string attached to it, and then the other end of the string is attached to a chair . I usually just do that with a paperclip, but I can wrap around so that I'm not having to actually tie it to the chair. I can just put the string around the leg of the chair and hook the paperclip back to the string. And what they're focusing on this time is plucking , but changing the tension or the tightness of the string when they are plucking. Interesting how that affects the pitch.

On the next slide, I have the FOSS-ulele, which is just string across the table and the student at the far end of the table has the string wrapped around a pencil at the far end. And, they're pulling that string that is attached to the pencil to make it tighter, while the other girl is plucking the strings , again, looking on the idea of tension and how tension affects that pitch.

And then the final investigation talks about how sound travels. And we look at how sound travels through air, by using a tuning fork and a listening tube , how it travels through water using a tub of water and a stethoscope, and how it travels through solids, such as a string and wooden dowels. The listening tube is just a piece of poster board made into a tube and the megaphone is just an art piece of poster board that is made into a megaphone. So, I just used poster board to make these.

So, students using the listening tube sand tuning forks compare how the sound travels when they put the tuning forks close to the end of the listening tube and how it really makes it easier to hear the tuning fork through the tube. Because it’s traveling through the air and the listening tube helps focus that air that is traveling through. They compare the shape of the megaphone to the shape of their ear and how that helps bring the account in or direct the sound. They used stethoscope to snap their fingers underwater to show that they can hear to the stethoscopes the snapping of their fingers . And of course, we couldn’t do sound without using the string telephones. And the wood dowel, all they do is scratch the end.

I have pictures of students to those particular activities . The student who has the long tube with the tuning fork at the end of it . The second student in the middle that has -- is snapping her fingers in the water and getting ready to place her stethoscope in to see if she can hear it. The student in the upper right has a dowel up to her ear and I just have the students place a piece of Kleenex over the dowel part after ear, and then she is scratching the and and can actually hear the vibration of her scratching through the dowel. And with string telephones I start with two people, have one person talking the other listen and again, we have to talk about how this needs to be very tight because if it's not tight it's not going to travel well on the string . And then we like to add other people and see how many people we can get to hear when one person talks.

So, concerning the next-generation science standards, I’ve have included at the end of the PowerPoint which you will receive the lower elementary, first and third grade standards that align with the lessons I have mentioned today and the fourth and middle school lessons that align with those standards. And I will open the rest of the time up. We have about 10 min. for questions.

[ROBIN] Thanks very much, Sara. That was really a lot to think about. I was taking some notes myself. We do have a question and answer box on the screen if anyone wants to enter a question . I just wanted to get back to one thing that you said, Sara , while we are waiting. You mentioned in some spots that FOSS actually has a kit for that particular activity , and I was just wondering if you could talk some about how the kits are ordered and what kind of individual components can you also get from that website?

[SARA] You bet. Delta education sells the entire kit , which includes just about everything you would need with the exception of maybe paper towels , you know, to clean up the water. But pretty much everything else is included in the entire kit. But, because those can be kind of costly when you are purchasing the whole kit, I have tended to purchase just the pieces that I can't find around the house . Sometimes there are local school districts that have already purchased the kits and you can borrow from those schools as well. We have area education agencies here in Iowa and those agencies often will loan out the kits to us as well. -- Will loan out the kits to us as well.

[ROBIN] That's a good tip. And so when you are ordering the kit , is it one per student or do they come in a group, like a unit price?

[SARA] It covers enough for 32 students.

[ROBIN] Wow. Okay, that ought to be enough.

[SARA] Usually, when I offer my programs, I have about 15 to 20 students, but I still end up using all of the materials, just because I like to have more of the students getting their hands right on the materials.

[ROBIN]Okay. Anyone have any other questions, either specific to these experiments or perhaps want to share other activities that you have done with groups of students? I think what I like particularly about the ones that you demonstrated, Sara, is that we do see that a lot of kids get to participate at once. So many times, there is the one person, doing all of the experiment, and usually, you know, the child with some sensory impairment ends up being the observer or notetaker and it was nice to see in the photos a big group of kids participating .

Karen asks, do you give classes to test kits for client or do you also include general as kids?

[SARA] I have done both. I do tend to make sure that I offer more of them just to students that are blind or visually impaired but the reason I do that is partially because we talk a lot about speaking up and some those other expanded core skills to make sure that they are part of it. When you bring in students that have vision as you see in the classroom a lot of times, those students can help too much or take over too much and then they are ready to move on so by doing this with students that are visually impaired only, it allows the students to get a lot more time to just mess with the science.

[ROBIN] Do you ever -- and I know many of you teach science and probably have to manage this all the time, particularly in inclusive classrooms I will start with that disclaimer, I think I know the answer -- but you ever have difficulty with teachers or districts concerned about safety when you're using electricity and magnets and things like that?

[SARA] I often get those kinds of questions. And so it takes a lot of encouragement to talk about the percussions you should take to make it as accessible for the student with a visual impairment. You know, just talk about the safety. Before you go in, you do that with all of the students anyway. So, there really is no reason to have to exclude those students just because of their vision.

[ROBIN] Thanks. We have about 5 min. so while we remain waiting for any other questions, let's talk some more about his work groups. We've got a number of people who are already signed up to participate and many of them are on this call today, but other people who may have just , maybe their mind is churning in their thinking that ideas that they have, can you explain the work groups that will take place in May?

[SARA]You bet. Last I heard, there were about 20 people, so we will probably split those up in half so that have to present a lesson that they used or that they find it to be accessible for students, or a lesson that they know that they need to teach and are wondering about ideas on how they can make it accessible. So it can go either direction. It's meant to be so that students or the adults are presenting these particular lessons and then there will be discussion pertaining to the lessons.

[ROBIN] Great. And we are offering continuing education, professional development points and ACVREP credits, whichever the attorney for participating in the script as well and I think particularly for teachers who may be pretty far away from other science teachers , particularly working with kids who have disabilities or just don't really get the opportunity to talk to other science teachers, even in other regions, I think what is interesting about hearing people talk about experiments that they have developed in their classes, so many times, you know, because as you have said, Sara, you're looking for things that are around at easy hand and you'll hear ideas from people who live in another climate or another kind of region or other kind of natural materials that maybe you don't have close at hand so you would not have thought of using sand or seawater or, you know, snow. Because you're just not in those places where those places are readily at hand and it can generate some band new ideas that maybe you have not thought of.

[SARA] Right. It's just a chance for us to all learn from each other.

[ROBIN] All right. Last call. Go ahead.

[SARA] I also wanted to mention that I am going to ask that people submit three questions, you are welcome to submit it here as well, but, will everybody that is taking those two sessions, should submit three questions to me. I believe you have addressed forward to send those questions.

[ROBIN] Yes, I do. It's perkins.elearning@perkins.org and as I mentioned, those of you who have already registered will get this material also in a follow-up. If you haven’t yet registered, look for your thank you e-mail that usually comes after these sessions where we send you the recording of the webinar and copies of the handouts of the presentation, and there will be registration information there as well if you'd like to participate. Those already registered in the work groups will get a follow-up message from us explaining those things. But those kinds of questions of inquiry will really help drive where these work groups take the next step.

[SARA]That's right.

[ROBIN] But this has been really exciting and it’s nice for us to be able to really roll our sleeves up into a content area like this . We don't often get the opportunity to do that. Excuse me. And for those of you who are participating in a time zone that may be in the middle of your day, I really appreciate your being able to take some time out to do that and hope you will share the ideas in the recorded version with your colleagues and students, if you're in personnel prep, these are some good ideas and good starting places. I will thank you here publicly, though our work will continue for the rest of the month as we go through these work groups and look forward to talking with you again soon.

[SARA] Thank you, Robin.

[ROBIN] Sure. Have a great afternoon. Good night, everybody.

[ Event concluded ]