

“Little STEAMers Focus Activity #1: Subitizing” Webinar  
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Video Transcript

Do you have our contact information please reach out to us as we kind of go through and if you have ideas or you'd like some resources, we are here to help you. On not just your "Little Steamers" that you have other things you need the things that we can help you out with.

Some housekeeping issues before we really get into subitizing. I'm so all of you started either muted or with your video ask I do believe at this point everybody almost everybody is in the "Little Steamers" program, so I mentioned in my emails this is really a great time for you to kind of see who you'll be working with over at this experience.

We will have an online community where you can ask each other questions and share ideas.

So if you feel comfortable and want to turn your video on please do so if you don't that's absolutely okay too. I'm sure some of you have had a really long days at home with your kids and you're not video ready. That's absolutely okay. We get it.

I also would encourage you to type comments and questions into the chat box, which is one way that we will be sharing

ideas as we go through this webinar. And I do want to tell you so this is going to be recorded. We're recording right now and I will upload this into the Moodle. I did send out a couple of emails with how to login to the Moodle. You want to make sure you take time to do that. That's where these webinars will go plus all of the resources that we talked about today will go in the Moodle.

You have any problems I'm happy to

help you. All right.

We're going to go ahead and get started and what we're here today this first focus activity is talking about subitizing. And subitizing, subitizing, some people say, all the same things, that we're going to talk about the stages of subitizing. We're going to talk about what it is we're also going to talk about how in the early childhood classroom how it's so important that we lay the foundation in subitizing so that our students are fluent and flexible mathematicians when they get into Elementary School in the primary grades.

We're also going to talk about just some exercises that you can do. Games, transition activities, small group activities, and then we're going to look at some resources that have to do with kindergarten readiness and STEM learning. So those are two very appropriate things for where your kids currently are.

The best way to start off with what is subitizing is to go ahead and do subitizing yourself.

So what I'm going to do is I'm going to splash three images on your screen. And these are going to go really quickly, so you have to pay attention. They're like going to flash for half a second.

And what I am curious to know is what you see. So how many do you see?

And once these three images show, I'm going to send out a poll and I'm going to ask you to go ahead and get the answer that you said. So how many do you see? Here we go.

That was pretty quick.

I'm going to go ahead and send out the poll. Let's make sure I can do this.

It's all a learning curve for all of us. I'm going to launch the poll... and Cassandra is it on your screen?

Excellent.

All right so go ahead and submit your answers. What did you see? How many?

All right.

So for those of you that were able to answer, here is what we have. So all of you ended up seeing four, two, and those were the three numbers that you saw. I'm going to go ahead and share those results with you.

A very nice job.

Four, two, and five and you saw three different representations of numbers. So if I go back here, we can see that we saw a dot pattern that's

familiar with a die.

2 four our finger pattern. And you saw a five on a ten frame.

So, three different representations.

This is what we know about subitizing. So subitizing... we think about we see these numbers they go across our screen really quickly, so now I just want to know when you can do this by typing into your chatbox, how do you know how many? They went so quickly you probably didn't have enough time to count them yourself, so how did you know?

Go ahead and take a second for your answers in the chatbox. Everyone should be able to see the chat box and this is also an area that you can

go ahead and type in questions that you have that Cassandra can help out with or we can save for later.

Patterns, past experiences, memory.

All in patterns. Lots of talk about patterns which is great.

Very nice job. Experiences and patterns. Very nice.

That grouping. Past experiences.

So those are all excellent. And that is exactly what I would expect from you as adults

and teachers. That you would be able to know what those are because they come from memory. You're familiar with them. Their patterns that you instantly recognize and you don't really have to think too much about.

Well this is exactly what subitizing is. So subitizing is...

something that currently we are spending a lot of time talking about in the early childhood classroom, but also in the primary grades.

Although it's a recent thing that we're really trying to work on with students, it's not new by any means, and was first coined in 1914 by E. L. Kaufman and is supported by someone that we're very familiar with Jean Piaget, he's a huge huge promoter of child development and the Constructivist Theory.

Subitus, the Latin adjective is, we use

for the word subitizing and it means "sudden" so subitizing is essentially just

defining instantly seeing how many. So flashing up on the screen, we can automatically see how many there are and it requires no counting.

So subitizing has been around for a while. There's been a lot of talk from researchers about what subitizing is and it kind of comes down to being like a chicken in the or the egg thing. What comes first? We know that with our early childhood students, we talked a lot about counting and counting is so important. We spend a lot of time counting. We have them count how many goldfish they have for snacks, how many rectangles they see in the classroom, how many students are standing in line. Counting is really important. We'll talk about the relationship between teaching counting and teaching subitizing, but one of the things that we really understand with the history of subitizing is just that we some people say that subitizing is a precursor to counting and some people say that counting is a precursor to subitizing.

But, at the end of the day, what's really interesting is that...

even at infancy, there's a lot of research and a lot of studies that show that babies, infants are able to subitize.

So one of the really interesting stories that came out of this research... you can see down here the source for this is Clements and you have all these articles available to you... is that they had a 6 month old baby, a six-month-old infant, and in front of this child there were three images. One had one dot, two dots, three dots. And what researchers saw is that when they sounded chimes as if they sounded chimes three times, the infants eyes would go to the card that had the three dots.

So they instinctively and naturally are able to understand what these values look like.

Types of subitizing and these are important because perceptual subitizing which is the first type of subitizing and both of them have like different stages and there's about six different stages.

What perceptual subitizing is what we spend a lot of time doing in the early elementary classroom,

or the early childhood classroom..

Perceptual subitizing is what you just did . It's recognizing a number instantly without having to use other mathematical processes.

And that's essentially saying "I don't have to add them", "I don't have to count them", "I don't have to be worried about grouping or clustering." I can just look at that four on that die pattern and I know it's a 4.

As we go through their different stages, so infants to two-year olds are really good at subitizing up to two... sometimes three.

And if you've ever had a small child, I have my second daughter just turned two and I see this with her. She asked for two binkies every single night. And she knows if she doesn't have two binkies. She can't do, she doesn't have very good like one to one counting correspondence, but she knows if she doesn't have two binkies. So we start seeing that. For pre-schoolers, they are perceptually subitizing up to 5. So 5 or fewer. So that's really what we're working on is working with students to be able to recognize values and not just die patterns. Finger patterns. I'm holding up a four. I'm holding up a three. I'm holding up a two.

Looking at tally marks. Ok, those representations, multiple representations, up to five. Five or fewer for preschoolers.

Some students may be able to start moving more towards conceptual. Adults are really good at being perceptual subitizers. Most adults can roll a die and without counting, be able to count up to six.

Now perceptual subitizing is essential for being able to then do conceptual subitizing.

Conceptual subitizing requires math skills.

And what we do here is we start understanding that some number patterns are parts of a whole. So a pattern is a composite of parts of a whole.

So this is where we started spending a lot of time with primary grade students. Elementary grade students. They are looking at larger numbers.

For example, here is a dot pattern that has a seven. A conceptual subitizer is able to say "I know that's a seven because I see a group of three, a group of three, and one. And I know that three and three and one is seven

But if they don't have that perceptual subitizing of being able to say I know that's a three. I know that's a three and I know that's a one, they're never going to be able to get up to that conceptual subitizer.

So that's a really important skill that we want the students to have as they move on. That's really what we work on moving up through the elementary grade level.

So just kind of reinforce this idea and this is a really fun activity to do. I know a lot of elementary teachers that do this with their students at the beginning of the year at just trying to instill the

idea that math is not rigid. There's a lot of flexibility in mathematics. I'm going to ask you what you see. So once again I'm gonna flash something on your screen.

And I want you to pay attention to how many dots you see. And then how you see them. And I know the question how do you see them is strange.

But...I'll give you some more information on that in a second.

So, here we go.

OK.

So in the chat box,

tell me how many dots you saw and then how did you see them? Were they arranged in a certain way? Were they grouped in a certain way how did you see those dots?

All right. Good. So, a couple of different answers here. Seven, three, three, and one in the center. So almost like a triangle with one in the center. Three on one side and four on the other. Total of seven. Saw it as two on the top,

three in the middle, two on the bottom. These are all great answers and it's so interesting how people just looking at the same image can visualize that in different ways.

So, you can kind of see how important that is just to reiterate to our student's how math is still flexible.

So, to kind of show you what this may look like, some of you may have seen it this way. So you may just have seen a dot pattern of four with three going through the middle and that would be equal to seven.

Some of you may have seen a five dot pattern in the center with two on the outside which would tell you that is seven.

Others may have seen the three in the three with the dot in the middle. So there's lots of ways to see this. And these are just some I just randomly came up with. Some some people may have seen two like going diagonal from the bottom two and then three and then two and know that that is equal to seven also.

So even this is just kind of an interesting activity just to do with kids tell me how you saw it draw how you saw it. And come up here and show me how you saw this. Because there are so many different ways to visualize that. And this is a great opportunity for kids to practice their subitizing.

Early Childhood students can do this. Here is an example of two conversations from 4-year olds that are really focusing on just three to five age range with your Pre-K students, your preschool students.

On this is taking this conversation is taken from an article published by the Ames Center and this lady showed two students, Maria, four years, four months, and Omar just turned four. This dot pattern of the five and she asked what did you see and you can just tell by their responses how they see it differently but how they're also able to communicate that. And are able to

change their vision. OK, so how did you see it? I saw two at night, two and a one. Omar says I saw a square with a dot in the middle and then he says, "Oh no. I see two on the top and one in the middle and two on the bottom." So they're being flexible in the way that they're looking at these patterns which is a great skill that we want our students develop.

So here's kind of just a very similar activity.

OK.

So, why should my students be doing this? Why is subitizing so important? It just seems so simple. Well, first of all,

being able to look at and develop and recognition of pattern. Does this really goes beyond geometry. Yes, when we look at number patterns and dot patterns especially, we're looking at geometry and we're looking at symmetry and rectangular arrays.

But we also want to start giving them the ability to look at to see a number and hold it in their head and that's really going to be important when they move up into other grade levels and they're adding and subtracting. They need to be able to visualize numbers without having to count the. OK.

And also does a great job of building numbers and number sense. And previously being in a middle school math classroom, I can tell you that this is something that students are lacking is the ability to be just familiar and flexible with numbers. We want them to be really good at just being able to estimate, to group numbers differently. That makes them much better math students.

It also helps build a foundation for algebraic thinking. So this is important because we want them to be able to understand that numbers are made up of parts. And not only that but we can use those parts to add and subtract.

And finally, it's efficient. We need efficient problem solvers so it's really important for students to be developing that skill.

So, I wanted to do an example with you just to kind of show you how this plays into a role at a higher grade level.

So here you see on your screen a number path. So one of the resources that I wanted that I really want to share with you and it is really influential to me as... Christina Tondevold is a really wonderful math resource and she has an organization called "Building Math Right." She has free PD has great resources. I have the live link that I'll share with you.

She does a lot of work with number paths. And number paths are something that if you don't use them currently we're going to introduce to your students...

through Little Steamers as we do these activities. But a number path is different than a number line. A number line is actually really abstract for kids and a number path shows them each of the intervals here.

So what I'm going to ask you to do is and I can't see you do this this is totally safe.

I'm going to ask you to show me six and take your finger put it on your computer screen or your iPad show me six.

I can see some of you moving.

Okay so what typically happens when we say show me six, all the time with students, and sometimes with adults as they do this.

Show me six and they will say well, there is six.

And that's correct. That is the numeral six. However, when we say show me six, what we really need students to understand is this is six.

Six is a quantity. Okay. So six is 1 and 2 and 3 and 4 and 5 and 6.

And this is important for them to understand because then when they are posed with a problem like what's  $6 + 5$ .

They're able to say okay I know that six is six individual pieces and five individual pieces and when I put those together it equals eleven.

Now this is how a student with that...

is not as burst into subitizing may see if they count individually. One two three four five six seven eight nine ten eleven and they count individual pieces. Or they just simply memorize what's  $6 + 5$  that's 11.

There is nothing wrong with this. However, if we don't continue to teach students strategies especially subitizing, they will never move past memorizing facts and counting on their fingers. so...

If we work with students on subitizing and they're able to picture those images in their minds of what a six looks like and a 7 for example on a 10 frame. They may see in their head. Okay a six looks like this. Is a five and a one and a seven is a five in a two. So, say so they see these ten frames. They may develop strategies on solving these problems that go beyond individually counting before memorizing.

So, for example a student may say okay well I'm going to do...

this. And I'm going to take my four and I'm going to move them to make a ten. Making fives and making tens are really important in elementary school. They spend a lot of time making fives and making tens. They are friendly numbers.

So a student that is really good at subitizing and has that number sense or able to do that, then they're able to look at, okay, I made a 10, I have three leftover.  $6 + 7$  is thirteen.

Ok. So why is subitizing is so important and how it develops proficient inflexible mathematicians.

Hey, so how do I get started? Well...

like is everything in early childhood a lot of this is through play. And there's really not a wrong way to practice subitizing. Now one thing that Christina Tondevold, that I mentioned earlier, will tell you...

if you have students, and I know that many of us do, that come from...

environments where they have unstable homes, unstable routines,

there is sometimes a lack of trust and sometimes that actually takes them longer to develop these subitizing skills. Because they don't trust it. They don't trust that every single time they roll a five on a die, it's going to be a five. Or that if I hold up this many fingers it's going to be six./ It's just takes them a little bit longer, so I think that's something interesting to share.

To get you started, so, some ways that you can just build it into your everyday centers and daily activities.

This includes subitizing cards. So I'll show you at the end of this in Moodle, how you can download I have a download where you can print off one through ten and finger representations, dot patterns, ten frames, tally marks. There's a whole bunch of them. Just include them into your centers. Put them into your play area. Put them into your block centers. And sooner or later, students will figure out ways to use them in their play.

Another one is a great one is attention getter. So whenever you're trying to either go into transitions or you need the kids to stop talking and get their attention. Show me four. Show me three. Show me two. And it's interesting too, because some kids show you two like this, some will show you three like this, some kids will show you three this way. There's a whole bunch of different ways and that's great to have them develop that flexibility in their thinking.

In terms of time, it's literacy. Two books that I have here and I actually have them right here also that are great if you'd never seen this is how many by Christopher Danielson. This is a really great book because it's simply images and this is totally open so here's an image right here, a bunch of avocados.

How many? And students can talk about how many there are of a bunch of things. How many kits are there? How many are empty? How many are full? How many halves are there? How are they arranged? How many rows are there?

This is a really great very open-ended book to talk about counting and subitizing. And then this one, my daughter, I also have a preschooler, she just got her hands on today, and this is called "Ten Black Dots" by Donald Crews.

And it has just really great...

little stories about representations of black dots. And they're very cheap on Amazon where I bought them from and they actually got delivered before the end of April. So, that was great.

But those are two literacy connections that you can have. Auditory learning so playing, for example, chimes, clapping have them hold up the card that represents the number of times that you clapped.

And then the next one I want to share with you, this is one of my favorite ways, on Erickson Institute, which is based out of Chicago, has really great resources for early childhood.

One of the ones that they have on talking about subitizing is how to use it during transition. So I'm going to play for you a quick video.

And Cassandra told me that everybody can hear so I just want you to notice what the teacher is doing and how she uses this as a transition method for her kids.

[video] I'll be my friend so to go to gym today I'm going to have you tell me how many ducks you think I guess ready.

Do you want to go first?

Oops, sorry. Just turning it up for you. Hey. Can you show me how many. I see you show me three fingers for three dots behind your laughter how many. Do you like the way you show me three three fingers for three. Hey Arnold are you ready are you ready. Anna did you see you I see that you show me onto can you show me to and once that is three for the three dots gun go to your laughter Jordan are you ready okay show me how many. All good try you show me four fingers that are too.. [end of video]. So that's just a

sample of one way that you can use it during transitions and I thought that was really simple way to do it. So she just had dot patterns on index cards on a ring

and it was really easy and that actually provides a really great baseline for some good questions. So, first of all you saw how she pointed out that the kids showed them on two fingers, showed a couple different ways. Its also a great way to start talking about kids, show me one more than or show me one less than those numbers. And you can obviously baseline your students

abnd on their abilities. They can go up to fives. Or, you can see there, I think they were just kind of going from one to

three. So some students don;t need pratice on what does a one through three look like?

So, you can adjust that...

as you go even through the school year.

OK. So, some games and activities to play and all of these links are alive. And so when you get the PDF in Moodle, you can go there and then...

Erickson has usually for all of them a video of a teacher doing it with his student plus the outcomes.

So, "Board Games, Card Games, and Dominoes"...

simple as that. Any games that kids can do at home that they have. I play trouble with my daughter. We have dominoes that we play even like some games that you don't have that you don't use, these representations you can substitute subitizing cards for it. So, for example,

shoots and ladders, has a spinner with a numbers on it. I take the spinner out and we just flip a card. That's how many she moves. You don't always have to use the tools that they give you. We can throw in those subitizing cards for extra practice.

"Match Them All" is from Erickson Institute and that's the image that you see there. So it's a bingo game. So you roll a die. And you cover up that number. If you roll a two, cover up the two fingers the two on the ten frame,

and then there are other representations.

"Make a Match" is a great one too so if you put all of your subitizing cards out and you're in a small group, kids just go around making matches. They may pick up a five on a ten frame and a five on a finger representation. They make a match and they get to keep it.

"Which One Doesn't Belong" is fine. You can take representations, so say I'm working on fours, I can take four representations of a four and then sneak a three in there and see if the kids can pick out the card that doesn't match the rest of them. Which one doesn't belong.

"Race to Ten" is a good one especially if you're working with 1-3 with some of your younger students, perhaps your three-year-olds. If you have a die that has a 1-2-3, 1-2-3 you have a roll and they start practicing filling up that time frame so you can use counters, those little mini erasers, pom poms,

whatever you have. First kid to get to 10 wins. And that's a great way of introducing a ten frame and having them understand how to fill it up top row first from left to right.

"Capture" is another easy one. It's just like "War", so you're looking at the larger number on and you can use the subitizing cards for that.

"Flash It" is a good one for like circle time or whole group instruction that's what we did where I just flashed those images and you say, "tell me what you saw".

It may say two, three, . You can use different representations. And then the last one is "Can You Find It?" So, if you have them lay out subitizing cards, you, as the teacher, call out number and ask them to find it, hold it up, and check their work.

Really easy simple things to do.

Doesn't require a lot of materials either, which is a great thing. If you have subitizing cards, you can laminate them you can use them

all the time. All right.

I'm in terms of subitizing and STEM, so anything that you have kids building that requires numbers, you can have them using these representations. One of my favorite activities that we'll do with you, when we eventually get to you, is building with interlock tiles and then kids follow building plans and all of them were using ten frames, numbers, finger images, tally marks. So anytime you're building something that has instructions perhaps or a recipe on how many do you see is here, call out a number, have them build that with counters or

on whatever manipulatives you had and then the one over on the side the stack and subitize, I found online, I actually really like this, so they have the numeral in front of them and then the cards have the dot pattern that they have to build based on that and you don't have to have those numerals. Those numerals instead of those written numbers you could also have two different representations, finger patterns, ten frame, that they have to dance go ahead and build that way and match them up.

Some resources that I've mentioned. These are all live links like I said. On the organization's "Building Math Minds" is a great one. Erikson Institute has a whole collaborative that they put out activities, resources for early childhood teachers and Zeno Math is a good one to that actually just came out and became accessible during this Covid fiasco. Take some time if you like it, if you're responsible for sharing resources with parents, this might be a good place to go as well.

Some research articles that I cited there for you and then the books does also take you to the Amazon links if you're interested in purchasing those books.

Before we go, one thing I did want to share with you is just what IMSA has on the side if you're interested we do have an "Ask a Specialist" right now so that is available through IMSA and that's a live link there and we have pre-k through 12 specialists if you as a teacher have questions about like where can I get resources for this thing I need or...

you can reference parents to it. We've been talking to lots of parents sort of like I need help understanding this. Where can I direct my student? and that is through preschool also. So chances are if you guys go to "Ask a Specialist", you'll probably get Cassandra or I. On the other thing that we had for you is what we call "Snack Boxes". So there is a pre-k Snack Box on the IMSA site. These are updated weekly that they're just vetted resources and activities that you can share with your parents, with your community, that they can go to and they can download and they do it every week with my preschooler.

They are jut fun things for them to do while while we're out of school and in this limbo.

To give you a brief...

look at focus activities that are coming up we hope that you

continue to join us and find these valuable. We're also here to listen to suggestions you have on what you need. That really is important to us, to Cassandra and I, as we developm this. So, the next one is on April 20. They are running every two weeks. This is goping to be on sorting. So, sorting everything. Sorting in a mth sense and sorting in a science sense and how that relates to STEAM. May 4th is going to be drawing so I'm going to do that while looking at observational drawings and directional drawings and what those look like in the early childhood classroom.

May 18th is patterns and again patterns in math but also patterns in science.

And then June 1st is a tentative one will see what you guys think how you feel what is happening in our world on June 1st and that would be loose parts. So loose parts in terms of STEAM and what that looks like for an early childhood classroom.

I do want to take a minute to see if anyone has any questions you're welcome to throw them into the chat box.

Or if you want to turn on your mic and go ahead and share questions that you have. I see here in the chat box,

Joy said she loved "Ten Black Dots" Very good. Yeah it's a great book. It's really very open. There's lots of things you can talk about with it.

Anyone have any questions?

Or have any comments? Anything you would like to share?

It was as interesting as in different types of people. I've been with my staff which I love.

What's in the different group in different folks is actually pretty...cool.

Well I'm really glad to hear that and I'm so glad that all that a lot of you are sharing your videos again like I said in my emails this is totally not how we wanted to roll out this program. We were really excited to get everybody together we do have a cohort of about 25 teachers across 18 classrooms and that's in a wide range all over the greater St. Louis area so we are really excited to introduce ourselves, meet you, and have you meet each other.

For now, this is just how it's going to have to be I guess.

Any other questions or comments?

I'm hoping to use some of these ideas and do short videos and sharing with my family's. Absolutely. Excellent. I'm like I said so there is lots of videos on that Erickson website they have wonderful videos that you can reference but they're also just kind of simple things to just videotape yourself really quick doing a couple activities that you can then share share to your families.

Well thank you so much for your input and if you do have any questions, Cassandra and I are always available you you definitely have our emails. I do want to show you so the next thing I'm here is the Moodle when you do have an opportunity to login you will see that there is you can't give in to the units right now for a little Steamers there still hidden we have \$39,000 worth of materials in our warehouse for you. All packed and ready. And we are dying to give it to you and all the fun stuff that you and your kids will be able to do but those are going to stay locked until we can kind of get into the swing of things with little Steamers. But, for now, everything for the focus activities will be housed in the Little Steamers activity folder.

So I will upload this recorded webinar for you to watch it. Again if you're interested and then also the articles, all the games and activities. I do have an arrow next to where it says subitizing cards. Those are what you can download and print. I know that right now you might not have the printing capabilities but when you do those are there for you. Then, the Building Math Minds and Erickson are links that'll take you to those organizations. You will definitely want to take the time to log into Moodle. Again, if you have questions, I'm here to help you.

Okay, so I can't I just want to say thank you to all of you for joining me and Cassandra tonight to take a look at subitizing. I hope you found something that was interesting or that you can back take with you to your classroom whenever you may be able to head back into there and share with your students.

We are really excited to continue these focus activities with you and learn with you and meet you so until then I want to say thank you on behalf of Cassandra and I. It was good to see and hear all of you and we will be around for whenever you need us.

Alright thank you very much.

See you guys later...