

## 10<sup>th</sup> Math Sum Angles Pre-Interview

Interviewer: Choose to teach this particular lesson to the students?

Teacher: Oh, okay. This lesson is on interior angles of polygons. It sort of fits into the sequence that we've been teaching. We've kind of started with parallel lines, interior angles of triangles, we've proven a lot of the angle relationships within those triangles and within those shapes. We did quadrilaterals recently, so we're kind of building up. There's a lot of topics in between those topics, so it's not like it goes exactly in sequence. The next logical step, or the next step, is interior angles of polygons.

I think the actual standard is something about area of polygons, which we are going to do next, but in order to calculate the area of many of these polygons you do need the little triangles that are inside them, which of course are part of the angles. You've got to get those special right triangles and all that stuff. It kind of fits into the progression that we've been going along.

Interviewer: With that said, what are the student learning outcomes for this lesson and how are they related to the larger sequence?

Teacher: We kind of talked about that a little bit with the angles. For this one, the sequence for this chapter, I guess you could call them chapters, we have the new state curriculum which I actually helped create parts of, not this one specifically. The main idea for this is, like I said, interior angles, exterior angles, and then area. Those are basically the 4 lessons. It's interior this time, next time we will do exterior, and then the following 2 lessons there's a little project I think it's area of the floor of a house or something like that.

[00:02:00] Basically for this lesson, the objective that I have for the students is all the polygons up to 10, so I guess 3-10, knowing the sum of the interior angles, and then being able to apply that or use that skill to find missing pieces. If you just give them, in an octagon you give them 7 angles, find the 8th angle, or in a regular octagon find one of the missing angles, or, and we'll try this at the end I don't know how far we'll go, but what if you stick a triangle on top of an octagon, can you find the resulting angles from that? That's the main focus for this. Try to stay away from exterior. It sort of overlaps of course, but that's kind of the place that we're going after this.

Interviewer: How would you describe the lesson, meaningful, useful, irrelevant to students' lives?

Teacher: To students' lives. I get this question every week I feel like. They're kind of slowing down now, but you always get the, "Mr. when am I going to use this?" There are many options, many different paths you can take, and I have tried all of them. I try to show them a real-life application, so I can try to show them all right you are, for example in this lesson we have a bench and you are cutting the wood to create the bench. What is the angle that you would need to cut it if you have a hexagon, the bench part of the bench and you have a hexagon and you want to cut it so it's sort of equally spaced what

angle would you cut it at?

Then of course I get from the kids, "Well Mr. I'm never going to make a bench." It's like "Okay, fine, but maybe someone else will. Relax." That's one of the kind of real world applications. In geometry, the majority end up being sort of building examples, like designing things. For this chapter, I believe the overall goal that they talk about at the end is designing a house and buying flooring for that house. That's kind of the final project we're going to do, so they will have to calculate the areas of rooms using those angles and then I think they get like \$30,000 that they've got to go online and research different types of flooring and stay within a budget and stuff like that.

[00:04:00] Again, I will have kids that will deny that they will ever put a floor in a house, but I've put floors in my house so it's a thing that happens. It's a thing you have to do. We try, or you break down and you just say, "You need it for the next test." That's the worst example, but for real life we're going to try to bring it in as much as possible.

Interviewer: That's easier with math.

Teacher: Yeah. Again, certain types of math. You get to the very abstract or complex algebra or things like that and I can give you an example, but it is electrical engineering, it is impedance, it's something that you don't understand yet. It's a higher level physics question. It's something interesting, but not at your level. I can try to explain it, but it's not going to work. I try to tell kids math is like a ladder, and in order to do many things in life such as get a medical degree or a nurse or a pharmacist or any of the hard sciences, you need to reach this ladder.

You may not need rung 5, but you'll need rung 10, and you can't get to rung 10 without rung 5. Again, they don't believe me, but we try.

Interviewer: What are the big questions you're using to drive student discussion?

Teacher: Again, the main idea is interior angles of a polygon, so the idea is what if I have any polygon, any sides, any configuration beside overlapping which is not a polygon, is there a standard way of finding those angles? No matter what they are. Even if I don't know what their measurements are. We're going to start by abstractly just drawing some polygons and just measuring them. Of course, that's not very accurate because their angles are not going to be perfect integers, but then we're going to say, "All right. What other method could we use? What can we use from the past that we already know? We know triangles add up to 180, so maybe we could chop one of these shapes into a triangle, or 2 triangles, or 3 triangles, or 4 triangles."

[00:06:00] That of course ends up giving you the formula and we derive it from there. From then it's just applications. How do you use that idea, that main idea of chopping a polygon into smaller polygons, the smallest polygon of course the triangle, and then getting that formula and applying the formula in other cases? That's the main thing we're going to go through.

Interviewer: How are you planning to check for understanding and assess the student outcome?

Teacher: We have the project, so that'll be in a couple weeks, kind of the end thing. That's the sort of larger summative assessment. Throughout the class I'll be walking around checking to see for individual problems. What are they doing? What strategies are they using? What mistakes might they be making? I try, we'll see how the time goes, I try to get a couple kids to show their work. I teach off of the iPad and I will just hand it to a kid. I found it's a lot better or a lot more comfortable for a lot of kids to show their work while they're in their seat rather than standing up at a board and trying to talk to people.

That's how I've kind of ended up doing this. It works really well with sped kids, but also just everyone else. There are kids that will like, "Ooh Mr. can I write the thing," just because they like to show their work and they like to show things to the class in a friendlier kind of way. That's kind of how I will use that, but again that's only 2 or 3 kids depending on what we do. The biggest thing is sort of as I walk around a little formative, just kind of see what they're doing, see where they're at. It's pretty obvious right away the kid that's just staring at it or the kid that's done in 5 seconds. That's the main idea.

Interviewer: How would you describe the lesson as engaging for students?

Teacher: Some students. It depends. It's math, so there's always those that just knee-jerk reaction they don't like math so they have their problems with it. I'm trying to bring in a couple more things to make it more engaging, and again you'll see this on the day, but I have sort of this animation that I made that is just, "What if I just screw this triangle up? Look at all the angles. Oh look, they're still adding up to the same thing. Let's try it for another one." At the beginning of the class, and I'm still trying to figure out exactly how I want to do this, we are going to have a little sort of hands-on thing where they in pairs or something draw those triangles or construct them.

[00:08:00]

Triangles, rectangles, parallel ... All these different types of shapes, and then measure their angles, so sort of a hands-on thing and try to generate those sums on their own. It's not going to be very accurate, so I'm still trying to figure out the best way to get the work out of there, but that's how we're going to try to grab it and then they'll be working together on the problems after that.

Interviewer: How would you plan to manage student behavior throughout the lesson, starting with expectation?

Teacher: Yeah. Student behavior is one of those things that it's not like a one day thing. It takes the whole year. They need the routine, they need the expectations, they need all these things. Obviously you do the little spot, put out little fires and stuff. I'm sure when they're being filmed they will be acting much better than they normally do. This class is pretty good though. Basically we have a procedure that they follow for the most part, which is sort of universal to this school, it's called DASH. It's date, agenda, standard or

lesson title, we don't actually put the standard, and then homework. It is up on the overhead. It will be the same everyday. We just change the little things, I have a template. Then there's a bell work.

They start off doing math, they start off working alone so that sort of settles them down gets them in the mood of doing math. Then throughout the lesson we have certain times when they will be listening and I can gently remind kids if they're talking or whatever or do proximity, stand next to them. Then when we have our group work, I will usually put either a timer, I will put some sort of thing on the board here's what we're doing. We are practicing. You are working with your table partner. You're working with your group. You are working alone, whatever it is the reminder, and then here is what you will accomplish. The handout #1-6 or whatever.

[00:10:00]

I'll keep that on the overhead first of all to remind me what we're doing, but also to show the kids that this is an expectation. Depending on what the class is doing or how they're going, I may also put a timer up and that's always good to keep them focused on this is the amount of time I have, and then sometimes okay I'm going to choose some people to present at the end so that motivates them a little better. I'm sure it'll be fine if there's a kid who just can't handle, they can work outside. There's all the little strategies that you can go through from there, but these guys are pretty good. I think it'll be fine.