Teacher: To see what we are going to talk to about today, let's look over at our math target. It says I am able to classify triangles by size or angles, and determine whether they are one or more of the following equilateral, scaling, isosceles, right, acute, or obtuse. Before we start I'm going to pass out some triangles. I need distribution managers to come get the triangles and pass them out to your table please.

Today's lesson will be all about triangles. I want to know what you know already. So I created this little chart and it's got a bunch of geometry vocabulary on it. What you're going to do is read the words and your in a place each word into a category. The categories are, this word is totally new to me, that is kind of like the three you know when you give the three and you're like I don't know what you're talking about, that's where that goes. This is, I've heard this word before but I'm not sure what it means. That would be kind of like a three minus, in between there. I know one definition or could use this word in a sentence, you would put it here. In the last category is, I know many ways this word could be used, could explain it to another person, and give examples, and you'll stick the word here.

You have a list of words here, you're going to put them in these different categories. I'm only gonna give you about five minutes to do this because it is just to let "Teacher" [00:02:00] know what you know, okay? I'm going to call distribution managers again, you are going to pass this paper out, and when you do you need to work immediately on this. Are we clear? So once you get it right your name, date, and get started on it. Here it is distribution managers.

While you are doing that I'm going to be doing some things on the board.

This is not asking questions time. I want to know what you already know. This is not graded, so don't be panicking about whether you get it right or wrong. It's not that type of thing. I just want to know what you already know.

I'm going to set the timer, just so this round doesn't distract.

[00:04:00]

A good way to keep track is simply to check them off as you write them down.
[00:06:00]

Make sure you write every word and at least one category.

Speaker 2: "Teacher"? Where do you want us to write if we run out of space in the box?

Teacher: Is at the last one? Just draw little arrow and write it at the bottom. Will you put the title like you know that one so I know, whatever the title is so I know what category you're adding to?

You've got 45 seconds left. [00:08:00]

There is the timer. What I want you to do is this, look at any words that you have left, that you have not written down. If you have no idea of that word please make sure it's on the list. Look at what you have left. I want to make sure that any word you don't know, if this word is totally new to me, it must be written down. Check the words that are left and make sure that's the case. Once that is done, give your paper to the distribution manager at your table, who will bring them to me. You have 10 more seconds. [00:10:00] Pencils down, please give your paper to the distribution manager. Distribution managers, you are going to bring me those papers and I'm going to trade you for some other paper.

Now we are ready to talk about these triangles. Before we start let's review what is a triangle. Triangle has a prefix in it, tri. What does tri mean?

Class: Three.

Teacher: Three what?

Class: Three sides.

Teacher: Three sides, three vertices, and what else?

Class: [crosstalk 00:11:37]

Teacher: So three sides, three vertices, and three angles. Is that all three? Who can tell me what the word triangle means? I need it nice and loud because I'm over here, "student" can you tell me from way back there, as loud as you can? [00:12:00]

Student: A triangle has three vertices, three sides, and three angles.

Teacher: Give her to claps because that is exactly right. Now we are going to learn about the more detailed ways to classify triangles. That is true. Triangles ... This looks like a triangle right? We know "Teacher" is the greatest artist of all time. This triangle is beautiful, so we can call triangles by different names, we can classify them. We can call it a right triangle, we can call it acute triangle, we can call it up to strangle, we can have an equilateral triangle, and isosceles triangle, or scaling triangle. When I'm saying these words, a lot of these words sound familiar. What in the world do you think a right triangle would be? [crosstalk 00:13:01]

There is a right angle in a triangle?

What you think a right triangle is? [crosstalk 00:13:31] Well that is just the right angle, what is a right triangle? It is just a guess you don't have to know yet. [crosstalk 00:13:51]

[00:14:00] I heard a couple of definitions for right triangle there, or alleged definitions. When we see the word right, what we automatically think? Raise your hand. 90°. What is an easy way to draw 90°?

Class: Protractor.

Teacher: You could use a protractor. What else could you do?

Class: An L.

Teacher: An L, what else could you do? 90°? Is that a 90° angle? No. "Teacher" is going to make sure that you know this is a perfect 90° angle. What can I do to make sure you guys know this is a perfect 90° angle?

Class: The little square.

Teacher: Put the little square there. If the triangle has a right angle in it, what do we call it? A right triangle. A right what?

Class: Triangle.

Teacher: A right what?

Class: Triangle.

Teacher: Right this is a right triangle. Easy right? What do you think an acute triangle is? Speak at your table. [crosstalk 00:15:18] What is less than 90°? One of the angles?. So if it is an acute triangle what does that mean? What do you think? What is an acute triangle? So I am going to erase this. What is an acute triangle? [00:16:00] Someone else tell me what an acute triangle is. "Student".

Student: Less than 90°.

Teacher: Less than 90°, I don't know what that means. It's a triangle that what?

Student: It's a triangle that is less than 90°.

Teacher: The triangle is less than 90°?

Student: Know the right angle.

Teacher: Who can help him out? "Student".

Student: It is a triangle with at least one angle at less than 90°.

Teacher: Perfect. Two claps for that. Lots of triangles that we draw our acute triangles. See this? Do you agree that this angle is less than 90°?

Class: Yes.

Teacher: And this angle is less than 90°?

Class: Yes.

Teacher: And this angle is less than 90°?

Class: Yes.

Teacher: And what we call them, who in our class is acute?

Class: "student".

Teacher: Last but not least, what is an obtuse triangle? Tell your table. [crosstalk 00:17:11]

                All right, give me five. What in the world is an obtuse triangle? "student".

Student: A triangle where at least one angle is more than 90°.

Teacher: Absolutely. A triangle where at least one angle that is more than 90°, hence an obtuse triangle. What we are going to do right now, you know that fancy piece of paper you have the has triangles on it? Find one that is a right triangle and actually write on it right. Find one that is acute, write on it, acute. [00:18:00] Find one that is an obtuse triangle, write on it, obtuse. I only want you to write on three triangles. There is more than one of each.

                Once you find all three, help your table. Only right on three. I told you to write on three on purpose. If somebody is struggling to find, help them out. [crosstalk 00:19:02] Remember you have a tool to help you. You have something that is called a what? A protractor. There should be no guessing. You can prove it with that tool, you can say "Teacher" I know this is a right triangle because if I measure this angle I have a 90° angle. [00:20:00]

                Raise your hand if you have not labeled three angles. Find somebody at your table that has and say, "can you help me please?".

                Table 5 do you have all three? Table 4 you have all three? You have 15 seconds. [crosstalk 00:20:53]

                Give me five. So we can classify ... I don't think you gave me five I need to have eyes on me. Still waiting for eyeballs. Still don't have one person's eyeballs. Thank you. We can classify triangles by their angles, Or we can classify triangles by their sides. Let's take a look at this word. Let me hear you say equilateral.

Class: Equilateral.

Teacher: Say it again.

Class: Equilateral.

Teacher: Take it up.

Class: Equilateral.

Teacher: Take it down.

Class: Equilateral.

Teacher: What in the world, when you see these letters EQU ... If I'm classifying an angle by its sides [00:22:00] And I have this EQU, EQU, EQU going on, what in the world could that possibly mean? If I am talking about the sides. Tell your table. [crosstalk 00:22:10]

                Does anybody have any ideas? Give me five. Raise your hand if you've got an idea. We are just going to listen to ideas, I am not going to say whether it is right or wrong. I am going to keep my for face really straight.

                "student", what you got?

Student: An equilateral triangle has equal sides, equal Vertex, and equal angles.

Teacher: Equal sides, vertex, and angles? What do you think?

Class: Same thing.

Teacher: Same thing? "student"?

Student: I think that an equilateral triangle, is a triangle with three equal sides.

Teacher: Three equal sides? Same thing. Three equal sides? We are going to pretend that I am drawing this perfectly because you know I am the best artist ever. [00:24:00] An equilateral triangle has equal sides, and in math we use symbols to represent that. Especially if it is somebody like "Teacher" that is trying to draw something perfectly, I am not that great at it. So you put a #on each side and that means that the lengths of the sides are identical. If I were to put a mark like this, this is telling you that this sides length is different than the sides. Are we clear? That is the first thing with equilateral triangles. Equilateral triangles have equal sides and they have equal angles. In math if you want to show that an angle is different we would give it an additional line. That would tell me that this angle measure is different than these two measure angles. Give me a number if you just understood what I said. Give me a one or a two.

                It's okay. I need to know. And equilateral triangle has equal sides and equal what?

Class: Angles.

Teacher:	I can't hear you.
Class:	Angles.
Teacher:	Angles. Now we have isosceles, and I want you to look. Can I hear you say isosceles?
Class:	Isosceles.
Teacher:	And again.
Class:	Isosceles.
Teacher:	One more time.
Class:	Isosceles.
Teacher:	Take it up.
Class:	Isosceles.
Teacher:	Bring it down.
Class:	Isosceles.
Teacher:	I am going to draw an isosceles triangle and I want you to use my picture and see if you can figure out what in the world and isosceles triangle is. This is now in isosceles triangle. What do you think that means? Tell to your table.[00:26:00] [crosstalk 00:26:01]
	Does anybody think they know what an isosceles triangle means? You're going to learn all this. This is just "Teacher" giving you a small lesson on it. "student".
Student:	A triangle with two equal sides?
Teacher:	Two equal sides and what else? To equal what?
Class:	Angles.
Teacher:	Can't hear you. Two equal sides and two equal angles. L st we have this last triangle called scalene. Can you say scalene?
Class:	Scalene.
Teacher:	Take it up.
Class:	Scalene.

Teacher: Take it down.

Class: Scalene.

Teacher: Scalene's are all their own character. Scalene follows no rules. What do you think a scalene triangle is? [crosstalk 00:27:56] [00:28:00] No equal sides and no equal what? [crosstalk 00:28:07] Give me five. What's a scalene triangle? That is the easiest one. No equal sides and no equal angles. The scalene one, Teacher calls the crazy triangle. Crazy triangle just means it's all different sides all different angles. Take your triangle sheet. You need to find one equilateral, one isosceles, and one scalene triangle and label it. You are going to need to use your tool. You are going to need to use the ruler on your tool because we are classifying by sides. Please do so now. [crosstalk 00:29:06]

Check it. Don't guess. Measure the sides. [00:30:00]

You've got 30 seconds. Did you measure? What's the measure of those sides? Prove it to me by measuring not guessing. If someone is stuck at your table you can help them out. [00:32:00] This was just a brief mini lesson from "Teacher". Now you are going to do some work on your own. Take a look at the web address at the top. The googly. Do you see the googly? What do you think you need to do with that googly? Please do so. I think this might be an l but it could be a one so try the L if that doesn't work then try the one. I should see no other tabs open on your chrome book. A self-directed learner would be logging in and typing in the web address. Yes it is a V at the end. Yes that is a P. I am just not sure if this is an L or A1. It's an L. It is a lower case l.

[00:34:00] If you are following instructions you will be looking at a page that has some crazy triangles and it says classifying triangles on the first three. Now wait until everyone is logged in. Do not start until everyone is logged in and I give you the information. [crosstalk 00:34:55]

I am waiting on just two more. Raise your hand if you are not in yet. Please plug in your headphones. [00:36:00] Be sure you share everything with me as candid comment, it's in the procedure, you will see that. Because I will be back here typing on your work like I always do, because that's how I roll.

Put your headphones in. You should not be talking. You will find this WebQuest has games, it has videos, and at the end we have a Kahoot. We can only play the Kahoot if 100% of my students have completed the column notes. Are you in? Please begin.

I am going to be moving some of the groups. If I tell you to move please just take your entire ... All of your work and go to a different table. [00:38:00] [00:40:00] [00:42:00] [00:44:00] Can I have "student" and "student" come back to me with just a pencil?

Do you have a pencil? In the center please do me a favor and write the word isosceles triangle. Isosceles triangle, what is it? A triangle with what? [00:46:00] Two equal sides. Can you draw me one? [inaudible 00:46:42]. Isosceles is the side not the angle. Look up there. Isosceles, equilateral, or scalene. We are talking about the length of the sides.

How about we make two sides 6 cm each. Okay that is one side, so now make the other side at 6 cm. [00:48:00] Now close up your triangle. Write the definition. Put it in. It's a triangle with what? Has two equal sides. Remember in math we use the little symbols to show what two sides are equal. [00:50:00] It has two equal sides but it also has two equal what? Angles. Now we have just decided it is isosceles because it has two equal sides. Now look at the other side where says angles right, acute, and obtuse. Which one is this? I that a right, acute, or obtuse? User protractor. That's how you prove it to me with your protractor. Your protractor measures angles. Is that less than 90? So what kind of angle is it? Add that to your triangle write acute.

This one triangle is isosceles and acute. Each triangle has two different ways to classify. Do you see that? Tell me what kind of angle does it have. Please write that word. [00:52:00]

It has an acute angle doesn't it? The triangle does. [inaudible 00:52:28] So what does it not have? It does not have three equal sides. What else does not have?

Speaker 2:   Three angles.

Teacher: It doesn't? It doesn't have three angles? One, two, three. All triangles have how many angles? Tri– angle, like tricycle. How many wheels does a tricycle have? So triangle means it has at least three what? Three sides, and three vertices, and three angles. So what doesn't it have? It does not have three equal sides. That is one thing it does not have. It doesn't have an obtuse angle, or a right angle. Can you write all those things down, that it does not have?

Say it does not have the following ...

[00:54:00] "student", I saw you finish those notes. So if you have finished everything you can bring me the fifth grade book and I will show you the geometry lesson that goes up.

Student: "Teacher"? Do we share [inaudible 00:54:19] If we are finished?

Teacher: Did you read the directions? Go back to your procedure. The very last step should say something about that.

Okay so that was the isosceles triangle, now we are going to do another one. This time let's do an equilateral triangle. Equilateral triangle, the first thing I want you to do is draw me one. Equilateral triangle has what? All equal sides. So you've got to do it. However long you want to make it as long as all three sides are the same.

What you are going to do is ... I'm not showing them, I'm going to show you. The interior angles of the triangle equal 180°. [00:56:00] So if you know two sides, two angles, you can always figure out the third angle by doing what? Classify this triangle by sides and then by its angles. So this has all three equal sides, so what is it? So this is an acute equilateral triangle. You have to classify it and it's two different ways. When everyone else is doing 10 through 14, you are going to do 5 to 11.

Are those three equal sides? Those don't look like treacle sides to me. Let me measure them. I'm checking your work. They need to be three equal sides. This one is 6 cm. This one is 6 cm. and this one is 5 cm which means it's a what? Isosceles.

What could you do? Problem solved. [inaudible 00:57:53] [00:58:00] You tell me what triangle. Stop asking me crazy questions. It's one of the cool ones yes. But is definitely still a triangle. That looks better.

Yes sir? Look at the sides. Isosceles. Is that it? Are you sure? Yes, every triangle can be classified by its angles and its sides.

What is the definition of an equilateral triangle? All the same ... What is that word you are trying to use? Equal ... It has all equal what? Write the definition. What is the definition? That all equilateral triangles have what? Equal what?

Speaker 2:   Sides.

Teacher: Very good. [01:00:00] [inaudible 01:00:24]O on your way to lunch? Does it hurt? What do you need to cover it? Go ahead and go to the nurse.

And angles. Exactly. So mark them so that I know that. You are proving it to me.

Please go and share your notes with me if you have not so that I can comment. Some of you have not shared them with me.

Okay so what does it have? What kind of angles are those? Right, obtuse, or acute?[01:02:00] It has all acute angles? "student"

Speaker 2:   I'll check.

Teacher: You have to check, that is what I'm talking about. Prove it to me. What kind of angle is it? That's a 90? What about this one? Less than 90? What is bigger 90 or 60? So is this less than 90? [inaudible 01:02:44]. So less than 90. So what kind of angles?

Speaker 2:   Acute.

Teacher: Acute angles. So that means it's equilateral and its what? Write that down. What doesn't it have? It doesn't have a certain kind of angle. It's up there stop guessing. It doesn't have what? I'm going to let you do that then you go back to your seats.

Students. [01:04:00] Bring a pencil please and your tool. Did you read the directions? I give you all the procedures, I'm kinda cool like that. I give you all the directions.

We are about to classify some angles, so at the center of this box please write the word isosceles ... It is written on the board for you. "student" can you draw me in isosceles triangle? What does an isosceles triangle have? Look up there, is it under angles or the under sides?

Okay. I'll get it thank you.

How long was that side you just drew? Can you draw me one please? You need to use your tool. What does an isosceles triangle have to have? Do you remember? Equilateral has three equal sides. How many dozen isosceles have? Can you help her out "student"?

Student: Two.

Teacher: So draw triangle with two equal sides. [01:06:00] You might want to flip that over so you can see the numbers the right way. How long do you want to make the sides? Dry triangle with two sides that are 4 cm. That is not a triangle yet, you have to draw the third side. Why did you change it? Oh it's equilateral.

You have to close it out, then go back into it.

Are you through? Write the definition. Is a triangle with what? Two equal ...

Speaker 2:   Sides.

Teacher: Write that down. You're a boss. Work on 16 through 18. There is no test out right? Thank you.

Actually, I'm sorry, your test out is different. Remember that other paper I gave you with the chart? Bring it to me and I will explain it to you. You and student come over here. Okay, so that's two equal sides [01:08:00] , Check the angle. Is it right, acute, or obtuse?

You are going to complete this chart by putting in a for always, and S for sometimes, or and N for never. So for example, in equilateral triangle, all angles are congruent. So and equilateral are they always congruent? So in that section you will put what letter? Go work on that.

So what is it? What kind of angles does it have? Near the word isosceles please also write the word acute. [inaudible 01:09:09] So and isosceles triangle has what kind of angles? Did you figure it out? Sit down please. Thank you.

Make sure you write it. Sit down. Boys we are not going to the bathroom right now. [01:10:00] Have a seat.

The boys bathroom in our building is flooding? Okay, all right, thank you. Bye. If you finish those three column notes I expect you to be doing your book work and your quick check. I need to see that.

How can we mark this triangle to know it has two equal sides? You remember those two hash marks I showed you earlier can you put them on the two equal sides please? If it has two equal sides it also has two equal something else. Two equal angles. And you put the angle marks so I know there equal angles. Then over here please write that has two equal angle. You know what doesn't have? [01:12:00] It absolutely does not. That is a

good one. Write that down. What else does not have? It does not have an obtuse angle. Write it.

I called you back here because I want you to know that every triangle can be classified into different ways. So we would call this triangle isosceles acute triangle. Do you understand that? So every triangle can be classified by the sides and be classified by the angle. I just wanted to make sure you knew that.

student, [inaudible 01:12:58], "student". Bring your stool and your pencil. First thing I would like you to write in the center box, please write isosceles. Make sure you spell it correctly considering I wrote it on the board for you.

Speaker 2: Do I get my notebook?

Teacher: Did you finish your three column notes?

Speaker 2: Mm-hmm (affirmative)

Teacher: What does it tell you to do in there? [01:14:00] Push the arrows student, I don't know what you're doing. Push the next arrow. Before that page. What does it say to do? Okay.

What is an isosceles triangle? Do you agree? But then your definition please. Very nice. The work on this. You're going to do this one. You can work on your workbook page. And then we will wait for everybody else okay? Draw it. How do you know that's isosceles? Did you use your tools to measure the size? What length do you want to make your sides? [01:16:00] How many? This is 7 cm. How many?

You can put those marks on there too, but [inaudible 01:16:22]. Make sure your notebook is labeled. If it has two equal sides, it also has two equal what? Write it in your definition, and then show me the picture. Show me on here what has two equal sides. Those little hash marks. Nice. If it has two equal sides it also has two equal what? Two equal sides, or what? So it has two equal what? Write your definition. Show me the hash marks. If it has two equal sides it also has two equal what? [01:18:00] Yeah, I will grade it for you. You will have to go get it from Teacher. Wait, is 15 due? For grade 5. Okay.

You can work on this. You read the rules and label it always, sometimes, or never. All right, so that is two equal sides, two equal angles. Now what kind of angles are these? Are they right, acute, or obtuse? How do you mark angles? Did you add it to your definition? What kind of angles are these? Right, acute, or obtuse? You don't have to guess. Use your protractor to figure it out. [01:20:00] I want you to know that every triangle can be classified two ways. This triangle is isosceles and what? Acute. Very good. What does it not have? Write it down. Does it have a right angle? Does it have an obtuse angle? Write it down.

You two are going to go work on this. Okay?

Everyone, you need to be coming to a stopping place. We will have to save our Cahoot for the end of the day, if we get through it. You need to secure your papers, windows are open. Make sure you still have your tool. Close your Chrome books.

What kind of angles are those? All of them. Are they obtuse? Are they bigger than 90? Show me. Are they right triangles?[01:22:00] So you need to know that every time we classify a triangle, it can be classified by sides and angle. So you can have an equilateral triangle that is also ...Scalene, and it kind of looks like it would be what? [inaudible 01:22:48] But it could be scalene and acute right? Or scalene and right?

Please secure your papers. [crosstalk 01:23:44] I [01:24:00] am waiting for a table that is ready. To be ready your crumbled needs to be closed. You are staying right here. You still have work to do. You understand how it goes in this classroom. When I give you an assignment it needs to be done. I need all papers secured and please get your lanyards. [inaudible 01:25:31] Oh no, you can keep them open. All right so, Teacher brought you these candies back [01:26:00] from student. So on your way out, you can take one and line up quickly, quietly, and correctly, at the green wall please. Is that a quiet correct line? Be facing the front, behind not beside the person facing in front of you, there should be no talking. We are going down to the cafeteria. Stay to the right. If you need some ketchup, walk quickly, do not run. [inaudible 01:27:35]

Speaker 11: Or just walking by the room. You can only see one student at a time. Done yeah?