

25: 8th_Science_Tides_Main

Teacher: All right, did you guys all copy your homework?

Students: Yes.

Teacher: As the same thing as yesterday, page 44 in your notebook if you're not done. That's the Construction Paper 1. Make sure you finish that up by Tuesday because I don't see you guys on Monday. If you want to come in for study hall, that's fine also. Today we have a whole bunch of things going on. We're going to finish up your or at we're going to at least work on a little bit of your Chrono Notes for tides. We're going to get into that blue paper that we sent up yesterday on Spring and Neap tides. We will have time to get into a tide calendar.

First thing I want to do is give you guys about 8 minutes or so to finish up your Cornell notes from yesterday? How far did you get? Halfway?

Students: Yeah.

Teacher: Halfway? We'll give you maybe 7 minutes. We'll try that and if you need a little bit more time then yeah, I'll give you another minute or two.

Student: Page 26, Sarah.

Teacher: It's on page 26 textbook. On your notebook, page 47. You need to have at least two or more diagrams. Don't have to be colored, don't have to be perfect. Just sketch it out. As long as it relates to anything in your page 26. Any questions? You guys can go. I mentioned that you can work together.

Students: Yes.

Teacher: Did I say I want you to work together.

Students: Yes.

Teacher: Good. Same thing applies then. You guys can talk. Sorry, I can't play radio today. Time isn't there. Who was absent yesterday? "student" and?

Students: [inaudible 00:01:51].

Teacher: We started Chrono notes from page ... Cody where's your book?

Student: Right here.

Teacher: Go open it up, Page [00:02:00] 26. You're doing the one page just on the section here. Don't forget if you guys are drawing a picture, make sure you label objects in there if

they involve circles or shapes. Make sure you're showing what they mean. Yes? Okay, off camera you have to talk. I want you to discuss. You should be working together as a group. Talk spurry.

Student: We'll just work these together?

Student: Do we do summary?

Teacher: No, when you get to the summary, hold off. Make sure you do the notes on the right section. Make sure you create your questions on the left side and please make sure you do not do what is a tide, what is a 'blank', what is a 'blank'. Try and put a little bit more meaning into your question because you have a lot of information on the right side that I can see. Make sure that kind of information can be answered in a little bit better question than a definition of question. Yes, [Shay 00:03:11]

Shay: Can I draw a diagram ...

Teacher: If you guys are finished, you can start reading page 27 in your textbook which is what we're going to be doing today. Gerald, you only have one question. Why are you opening that page? Does this cover all the [inaudible 00:03:46] section right here?

Student: No.

Teacher: No?

Student: No.

Teacher: You're going to add more. Kevin, are you finished?

Kevin: Mm-hmm (affirmative). [00:04:00]

Teacher: This whole thing, all of this right here answers all of the information on page 26?

Kevin: Yeah.

Teacher: You're summarizing the whole page. You understand how all this diagram works in your notes over here? You're going to add to it?

Kevin: Yeah, I am.

Teacher: Make sure you read the captions. "student" are you done? Can you make two of these for me?

Student: Yes.

Teacher: You got about 3 1/2 minutes left. If I feel that most of you guys are almost done up to the summary, then we'll end earlier. No problem. I'm just curious. Can you guys hold up about how many minutes you need? Zero, one, two. I'll give you extra that time. Three minutes. Why are you guys all quiet again? Oh, oh. I'm being filmed sitting on my desk. You're going to cut that part out later, right? [00:06:00]

You guys have two minutes left. If you're done, don't forget start reading page 27 because that's what today's all about. If you're done, if not don't worry. Keep working. You at 27?

Student: Mm-hmm (affirmative).

Teacher: Tell me about it.

Student: There is spring time.

Teacher: What is spring time? I think you should read again. Are you finished Cole? Can I see? Okay, cool. Did you read 27?

Cole: Mm-hmm (affirmative).

Teacher: Okay. I know a lot of you guys aren't done but you know what, we're going to cut it a little bit short. Don't worry about finishing it today. I think you guys at least all have the definition down, right?

Students: Yeah.

Teacher: We're going to stop there. I think that's enough to get us to where we want to go today. Let's talk about ... oh, who should I pick on today? Who's brave. "student", you said me. "student" tell us how does the book define tides? What are tides?

Student: They're on the rising and falling of the extreme. It happens in every 12.5 hours. It switches every six hours.

Teacher: Good. It's a steady, constant rising and falling of the ocean water levels. You're right, it does change every six hours. About how many tides do you have in a day?

Student: Four.

Student: Two.

Student: Three.

Teacher: How many tides do you have in a day?

Student: Two.

Teacher: Woah, you all have different [00:08:00] kind of answers. Let me rephrase that. How many types of tides can you get throughout a day? You get two, which one of them. High tide or a low tide. How many high tides will you get during a day, typically?

Student: Two.

Student: One.

Teacher: Typically, you get two. Then typically you have how many low tides?

Students: Two.

Teacher: Like “student” said, about every how many years if you have four?

Student: Twenty-four hours.

Student: Six.

Teacher: Can you rephrase that? If you have two high tides, two low tides and they all occur in one span of 24 hours, about how often does it change? “student”?

Student: Six hours.

Teacher: Six hours. Every six hours, you're going to have a high tide, you're going to have a low tide, you're going to have a high tide, you're going to have a low tide pretty consistently. Who else should I pick on? Anybody else who can be brave? Ian, explain to us why do we have tides? What causes the tides?

Ian: The gravity of the moon.

Teacher: The gravity of the moon. What do you mean? Somebody add to that. “student”.

Student: [inaudible 00:09:00]

Teacher: That’s correct. We’re going back to our trusty model here that we’ve been using in the past how many weeks already. That’s broken, right? We’re going to fix it. We’re looking at the pull, the gravitation pull of the moon. I hear happy birthday. We should stop. Is it done? We’re looking at the gravitational pull of the moon. Here’s a question for you that you should’ve just read about. I don’t know if I mentioned it yet. Does the sun exert a gravitational force on this system right here?

Students: Yes.

Teacher: Does the sun’s gravity put a force on Earth and the moon.

Students: Yes.

Teacher: How do you know that?

Student: Because it's orbiting.

Teacher: Because we're stuck in orbit, that's correct. Now you just told me that the moon also exerts gravity on the Earth, so which one is stronger?

Student: Sun.

Teacher: Is it going to be the sun or the moon. What do you guys?

Student: Sun.

Teacher: Why the sun "student"?

Student: Because it's bigger.

Teacher: So it's bigger? However [00:10:00] the moon is actually pulling stronger. Anybody have an idea why? Why?

Student: Because it's closer.

Teacher: It's closer. The moon is actually sitting closer. It's okay, you didn't know that yet. That's on the next page so don't worry about it. The moon is actually sitting closer than the sun even though the sun is way more massive. The stronger pull actually is coming from the moon. Does that mean that no gravity is coming from the sun?

Students: No.

Teacher: Not at all. It's still pulling on it. Both of them are pulling on it but the moon is actually pulling harder. Remember, does the moon ever stay still?

Students: No.

Teacher: No, we have the movement system, right? At all times, is the pull going to be equal?

Students: No.

Teacher: No, it's always going to be changing and that's why you have your tides. Now what we're going to do is look at your two-fold. That blue paper. Thank you "student". The blue paper that we set up yesterday ... anybody else was absent? Just you two here. We set up the front halves so now we're going to be working on spring tides and neap tides. Before we get into that, I want to make sure you guys know your learning targets for today. Your first one is you're going to clearly explain.

This is something we've been doing over the past weeks already, how the sun, moon and earth are interacting with each other and how does it impact earth. What we're going to do right is we're going to compare spring and neap tides and lastly, if we don't have time today we'll get to it the next time I see you but we're going to start it today.

You will be able to analyze the tide on your birthday and also predict what's going to happen to the future tides. That's coming up probably the next time I see you. What I'm going to have you do now is on that blue sheet, on the two outside flaps, you're going to be filling in the definition and paraphrase.

Student: [inaudible 00:11:48]

Teacher: No. You can use your pencil or pen, whatever. I want you to fill in the two top sections which is definition of spring tides, paraphrase of spring tides and the other one's for neap tides. [00:12:00]

If you guys want to work together on defining paraphrasing, that's fine. All we're doing is we're copying. Notes down. If you finish, you can go ahead and answer the bottom two, but if not, don't worry about it, we're going to move on to something else. Any questions?

Student: No.

Teacher: All right, you guys can go. I'll give you about five minutes. It's all on page 27. Oh, that's all right. Can you help push that up?

Student: Yeah.

Teacher: Okay, thanks. Why are you guys so quiet on the days you're supposed to be talking?

Student: We're always quiet.

Teacher: Liar. All right, voice is going. Well they picked that up on camera. Okay, we'll edit that out. Did you find it?

Student: Yeah.

Teacher: Page 27?

Student: Yes.

Teacher: You can't find what?

Student: The definition.

Teacher: It says, "Their combined forces." What is 'their'? What is it talking about though?

Student: The sun and the moon?

Student: The earth and the moon?

Student: No, the earth and the moon.

Teacher: The sun and moon [00:14:00] because both of those two are pulling on it. The forces of that are causing the bottom part of what you just read. The greatest differences. Did you guys all find the definition of spring tide?

Students: Yes.

Teacher: Should be something along the lines of maybe greatest differences or something, right? Hopefully. I say paraphrase is a little difficult for these, you know?

Students: Yeah.

Teacher: Little bit, so I think. That's where our discussion might come in handy. I agree. I would agree with that. Yes, "student"? Yes?

Student: Are we paraphrasing the definition?

Teacher: Yep. Think about what it means as the greatest difference between consecutive low and high tides. That'll be really low and then really high. How can you say that in other words besides how it's stated in the book? How are you doing on paraphrase? All right?

Students: Yeah.

Teacher: Yeah, if you're finished.

Student: Will I find it? Oh, I do.

Teacher: It's in the pictures. It's also in the reading.

Student: I just have to go along?

Teacher: No, you just go right on. It says it right here. Try to read it. [00:16:00]

Most of you guys almost done with definition paraphrase?

Students: No.

Teacher: One more minute, okay?

Student: I just started in.

Teacher: Paraphrase? Okay. We'll have to call it audible about the group thing, the month. That's to be group stuff though. You guys got another minute. One minute. Get as much as you can done in one minute and then we'll go over it, so don't freak out. We'll get in there.

Student: Are we almost done?

Teacher: Huh?

Student: Are we almost done with the paraphrase?

Teacher: Paraphrase, yeah. You having trouble? Okay, so what's the definition.

Student: The tide with the greatest difference between low and high tides.

Teacher: Think about what that means. It's the greatest difference from low water to high water. The greatest differences between. It's a big range, right? How can you say that in other words but mean the same thing?

Student: The tides level.

Teacher: They what?

Student: Changing? [00:18:00]

Teacher: Okay, but changes in what way? It's mentioning that the greatest difference between the lowest low and the highest high. The range, you guys know what range, right? The range is the highest in a spring tide. It's not a low range, it's a high range. For example, look on this picture. The water is going to go up a lot more rather than hardly anything in a spring time. Are you finished?

I know you guys have been doing definitions but do you understand the definitions?

Students: Yes.

Teacher: Good, because we're going to talk about it. I hope you understand it.

Student: We'll do two or just one?

Teacher: You're supposed to have done two. Let's see. I think the majority of you guys are done already. It's almost done so let's go over it. If you're not done, don't worry about it, we're going to talk about it right now so you have time to fill it in and make sure you have the right information. If you're scrambling, don't scramble. Just please pay attention and you'll be able to catch it. Let's go over what is the difference between a spring tide and a neap tide. Let's do spring first. "student", what's a spring tide.

Student: A spring tide is ... wait, the actual definition?

Teacher: Yeah, sure.

Student: Can I do a paraphrase of it?

Teacher: Okay.

Student: A spring tide is when the tide is extra high or extra low.

Teacher: That's a good paraphrase. You guys agree?

Students: Yes.

Teacher: Okay, stop. [00:20:00]

Put your pencils down. Everybody stand up. Wake up. Are you guys up?

Students: Yeah.

Teacher: Okay, because you're really dead today. You're making me look back. Stretch out, and get your energy flowing. Is that good? Sit down. You're not sleeping wake up.

Student: We're really tired.

Student: Let me stretch.

Teacher: That was a good example of spring tides. What do you think of the word spring tides? You guys remember the word spring from anything before?

Student: Spring roll.

Teacher: What's a spring? Spring roll. A spring makes you go higher. You guys know what the spring is in a toy or something? Let's say I put a spring on the ground. I put a spring on the ground, and I stand on it and if I jump, up and down. Can I jump higher?

Students: Yeah.

Teacher: I can. The definition of spring tide is the greatest difference: the very, very high tide versus the very, very low tide. The biggest difference between a high and a low. If you think of the word 'spring tide' think of jumping on a spring. It's going to go higher or lower, higher or lower. Does that make sense?

Students: Yeah.

Teacher: The opposite one is not the greatest differences but it is the ...

Student: Least.

Teacher: Least differences. You're not going to have a lot of that range or the fluctuation between a high tide and a low tide. Here's a question for you. Does it have to do with the moon?

Student: No. It has to do with the sun.

Student: The movement of the moon.

Teacher: Take a look at the diagrams on page 27. Take a look at the diagrams on page 27. There are two little mini diagrams on the right side of the page and they are specifically showing you a moon position. Spring tides is in the top or the bottom?

Students: Top.

Teacher: On the top. [00:22:00]

Are the earth, moon and sun in a straight line?

Students: Yes.

Teacher: Yes. Look at our trusty model here, are they in a straight line?

Students: Yes.

Teacher: Yes. Earlier you told me that it's the force of gravity that's causing tides. Why is it a high tide, why is it a low tide? I told you that the greater force comes from moon, right? If I do it this way, what moon phase am I in? It's a new moon, right? What direction of the pull of gravity is acting on earth right now? Where is it going? Put to the direction of the forces. Look at it.

If the force of the sun and the moon are pulling on earth, which one's are being pulled? Point that direction. It's pulling this way, right? If the earth is being pulled this way, what happened to the water? Would it come with the earth? It would. The water would actually be pulled before the actual earth, right because it's a fluid. It's a liquid. It would be pulled this way.

What's going to happen on this side of the earth? High tide, low tide?

Students: High tide.

Teacher: You have a high tide if the forces are coming on both sides. In your picture, there's also some water on the back side of the earth. Anybody have an idea why? Did you read the caption? Why "student"?

Student: Because the water left over flows to the opposite to the side of where the moon and the sun are.

Teacher: Very good. It's left over water. Remember, is the earth stationary?

Students: No.

Teacher: No. It's always spinning, it's always rotating right? All the water that's on the ... what's a walder? All the water that's on this side of the earth, it can be pulled to this force coming in one direction before it spins back around because it's spinning. Do you guys see that? It's going to stay there, which is the leftover water. What's going to happen on this side, if there's left over water?

Student: High tide.

Teacher: It's another high tide. You're pulling water somewhere, what happens to the two sides?

Students: Low tide.

Teacher: It's low tide. You're taking the water from one area you're moving in. All the water's doing is moving. You have your low tides [00:24:00] on the sides. At all times on earth, how many high tides do you have at all times?

Students: Two.

Teacher: You have two. One of them are coming from where the moon is pulling because that's a stronger pull, the other is on the back side. You also have how many low tides during a day at all times?

Students: Two.

Teacher: About two. Cool, any questions on that? Negative? All right, let's look at something that you might be familiar with. This is a really quick animation. Can you guys see it in the back?

Students: Yeah.

Teacher: What it's showing you are solar tides, means that it's the pull from the sun. Lunar tides is the pull from the moon. The yellow is the force acting on earth and the sun. The purple, the force acted upon by the moon. Do you guys know which one is bigger?

Student: Moon.

Teacher: The lunar pull. The moon pull is bigger. As the moon is orbiting one time, how long does that take again, the moon's orbit?

Student: One month.

Teacher: The moon's orbit takes month, remember? The moon cycle is one month. This real quick cycle is actually about 29-30 days. Notice the flow of the power it follows the moon. Do you guys see that? Wherever the moon is going, it's pretty much pulling the water with it.

Since you know the moon is cycling around based on moon phases and eclipses, it's actually pulling the water, and the tides are exactly aligned with where the moon is going. Does that make sense guys? Good. Let's get to our actual fun part of today. Well, I think it's fun. This is an example of a blown up version of two days in a tide calendar. I mentioned that we're going to be looking at a tide calendar today. It's a typical [00:26:00] 12 month calendar except that it shows a lot of different features not on a typical calendar.

This is what you're going to look at when you open up your tide calendar, except you're going to see 30 of these little blocks. I think it's December 30th and 31st. This is this year's calendar, so it's 2015. Then a whole bunch of things going on in here. Can you guys read the numbers in the back? Let's talk about what's on here.

First off, let's go in this side. First off on this, you have a moon key which tells you what is this representing?

Students: The moon phases.

Teacher: The moon phases. You have a full moon is represented by colored in yellow, new moon is pretty much a blank circle, and everything in between is going to be partially shaded in. Your moon phases are located here. If you look upon this picture, your moon phase is that. You also have a sun. It's hard to see but there's a sun on every day and there's an R&S. What does R&S stand for?

Student: Rise and set.

Teacher: Rise and set. It gives you the time of the sunrise, it gives you the time of the sunset on that day. Can you guys see that number? 6:00, 6:01. They're different. It should give you a hint as to if you look on a pattern maybe following this. Your moon is right here, the visual of the moon. The moon also has an R&S. Does the moon also rise and set?

Students: Yes.

Teacher: That's true. Why is that? Why does the sun rise and set for Earth? Is it because the sun moves.

Student: No.

Student: The rotation of the Earth.

Teacher: It's not the sun, it's we are the one that's moving, right? Since we are moving, isn't the moon going to be the same thing? It's going to look like it's rising and setting. The moon

also rises and sets and you have times that are a little bit different than a sun rise and sun set.

You have an H and an L. What do you guys think that means? High and low tide. Remember there are two high tides in a day around [00:28:00] and there about two low tides in a day. It tells you exactly what time it occurs and this is the height. It is occurring at 12:15 PM. About 0.6 feet high. The low tide is 6:37 at a -0.2. What you're looking at, let's look at the 31st. In this block right here is the actual tide level. You're looking at the blue. This is basically a graph. Your time throughout the day is here, this is 24 hours.

12 noon is right in the middle and as you're moving along, your tide is fluctuating. Why isn't it a straight point? Somebody tell me. Why "student"? Why doesn't it just take a sudden turn like that? Why Mary?

Mary: It takes times for both to do it.

Teacher: Because it takes time because the Earth is spinning. Does the earth ever do this, turn, turn, oh stop, turn again. Does it ever stop?

Student: No.

Teacher: No, right? The earth is constantly rotating. You're going to have a curve, a smooth curve. That's why there's no point. What you have here is a plotted dot of your high tide. Your high tide, you see it's at 1:39 AM. It's at 2.3 feet. It's going to be plotted right around there. You can't see it in the picture, sorry. The height is on the left side. This is the 2 foot line right here. One foot, zero feet. Your 2.3 is right around there and your next low tide will be about how many hours away?

Student: Six.

Student: Six.

Teacher: About six hours. From here to here, should be about six hours and from there to your next high tide, should be about?

Student: Six hours.

Teacher: Six hours. They're all six hours apart, high, low, high, low, high, low. Do you guys see that pattern?

Student: High-low.

Teacher: It's going forever and ever and ever on our calendar anyway. That's basically all that happens in this chart. Do you guys understand what's happening in the block?

Students: Yes.

Teacher: You sure?

Student: No.

Teacher: Any questions on what these numbers mean? [00:30:00]

Student: [inaudible 00:30:01]

Teacher: Good point. No questions. Okay, good.

Student: Wait.

Teacher: Yes, "student"?

Student: You said that two high tides and low tides.

Teacher: Yes, how about it?

Student: It took me a while.

Teacher: The person on your table that has the shortest hair. You are the recorder today. You are writing on that paper. Please put your good member's names on there. The person with the longest hair, you are not doing anything. You guys contributing to your group today. The other person or if you have two and then the other one.

The last person who has I guess the middle length hair or something, the middle length person, you are responsible for making sure that your group gets five patterns today and I'll explain. You are in charge of your group. What you're going to do on this half sheet of paper.

Student: It's good to make notes.

Teacher: Okay, hi. What you're going to do today is your group is going to get ... I think I have enough for two per group. You're going to get a tide calendar. You're going to flip through it. I know it's hard because the blocks are so tiny but you have to look very, very carefully at these numbers. These numbers are extremely significant in the tide calendar.

You guys are great observers right? You guys notice when there's different things about it so when you stare at the tide calendar, look for changes. Look at the numbers, look at the sunrise time. Look at the moonrise time. Does it have anything to do with the seasons as you are in maybe summertime versus [00:32:00] wintertime? Look at the moon phases, you're going to see the picture changing. Remember that Hawaiian moon calendar that I showed you? I showed you the different phases as it goes from day-to-day? Look for the same thing. The picture is much smaller but it's here.

See if there's a pattern or correlation between that and this. Just giving you guys a heads up. Right off the bat, probably at least 15-20 patterns that I could identify in the tide charts. Whether it's from day-to-day or from week to week or from month to month. Whatever you guys can find, I want you to write them down. Can do?

Together, you guys are going to be discussing and throwing out some ideas but don't talk too loud so your neighbors can hear you. Try and find at least five patterns. If you're not sure then just ask me or ask your table person. What are they called? Partners. Any questions before I pass out your tide calendars? You just have enough time. Share your calendars. Make sure you're sitting in an area where you can both or you can see both calendars. Person in charge, make sure you take care of that. Writer, you're in charge of writing. You guys going to share one.

Student: Yeah.

Teacher: Woah, you guys going to share one?

Student: Yeah.

Teacher: Okay. Oh, I didn't get to you guys. Sorry. Open it up, start looking for some patterns. If you guys would like another calendar, let me know. I have one extra. AJ, you can't see the calendar from where you're sitting so you guys have got to open it up and make sure you can all see.

Students: [crosstalk 00:33:55]

Teacher: Everything. Everything I just talked [00:34:00] about, you have your sunrise, sunset, your moonrise, moonset.

Student: Everything is moving all the time.

Teacher: Then write it down. What's the pattern? We're looking for patterns. You are looking specifically for a pattern. You guys know what a pattern is right?

Students: Yeah.

Teacher: Things that constantly change. Look for it. There are tons of them. Yes?

Student: [crosstalk 00:34:31]

Teacher: Is it the same throughout the whole month?

Student: Not the whole month.

Teacher: Okay, why don't you turn the pages and see what happens?

Student: As the months go into ...

Teacher: What's happening to the sunrise?

Student: The tide is a little bit taller.

Teacher: Is it getting earlier or later?

Student: They're getting higher.

Student: Earlier.

Teacher: It's getting earlier? Okay, so what season are we in, January and February? Is it cold now?

Student: Cold.

Teacher: What season if it's cold?

Student: Winter.

Teacher: Typically it's winter right? As you're going toward the spring or summer months, what do you think happens with the sunrise time? Try and look for that pattern. If you guys identify it, make sure you mark it down. Gerald, how can you see your tide calendar if you're sitting there? Huh?

Student: Yeah, they're getting earlier.

Teacher: Oh, that's a good pattern. Put that down.

Students: [crosstalk 00:35:30]

Student: When it goes into that month it gets lower but when it comes to summer, it gets higher and then it gets lower when it goes to the winter.

Teacher: Are you sure it's not fluctuating just in the month? Look at this week and compare that week to this week. Does this level look the same as this level?

Student: Half of each month is a low tide.

Teacher: Okay, good. That's a pattern. Try and figure out why. Look at your moon phases. Look at your sunrise, sunset.

Student: Look, it's the same. Look. [00:36:00]

Teacher: Same as?

Student: Almost the same.

Teacher: Okay. What happens as you move?

Student: It changes gradually.

Teacher: Why is it changing gradually?

Student: Because the stars ...

Student: No, it's getting more far away.

Teacher: Yes, "student"?

Student: Is it patterns between months or days?

Teacher: Anything. Pattern from day-to-day, from month to month or week to week.

Student: Every single month, the tide goes violet.

Teacher: That's good. Write that down.

Student: [inaudible 00:36:31]

Teacher: That's apparent, yeah. Well if you look at it and compare it to this one right here, is this higher?

Student: No.

Teacher: It's not really the full moon that's lowest. One of these are at a low, right? What phases are these right here? it's a quarter phase right?

Student: Yeah.

Teacher: Your quarter phases are not going to have us high tides. Huh? Yeah, that's pattern. What do you guys find here? What did you guys find?

Student: About every other week.

Teacher: Very good. Very good pattern. This group noticed one of the most obvious patterns that every other week, something is changing drastically. Every other week or every week, every other week.

Student: Yeah, I mean ...

Teacher: Yes.

Student: We were looking throughout the months now. It has that same thing. That one gets lower and that one gets higher and that one gets lower.

Teacher: Wait, one more time.

Student: Yeah, I was going to say we lost something.

Student: The blue things, what are they called?

Teacher: That's the tide level.

Student: Oh, the tide level?

Teacher: The water level.

Student: It shows up the tide [00:38:00] is getting higher and lower.

Teacher: You have a more range, is that what you're saying?

Student: Yeah.

Teacher: That's true. Does it correlate to anything about the moon phase? Okay, look at the moon phase as you see those blue lines.

Student: Oh.

Teacher: What did you find "student"?

Student: Big bumps and little bumps.

Teacher: It's the big bumps and then little bumps and then big bumps and little bumps.

Student: Yeah.

Teacher: Good pattern.

Student: [crosstalk 00:38:33]

Teacher: Write that pattern down. Did you guys find anything?

Student: No, I thought I did because it's like on the moon rising, it's like 3:32, like 4:22 then.

Teacher: Okay, so what's the pattern? That's a pattern.

Student: That's a pattern?

Teacher: It's a pattern. It's changing everyday right?

Student: The hours change.

Teacher: Okay, so write that down. How is it guys? Is it difficult?

Student: Not really.

Teacher: Is this difficult guys?

Student: Yes.

Teacher: Okay, we're going to wrap it up. What I want you to do, we're going to continue this on Tuesday. I want you to close your tide calendar. Can you please return it back to the table? Give me that piece of paper you guys have been writing on. Make sure your names are on it. We're going to fill in the rest on Tuesday.

Student: It's hard.

Teacher: Yeah, it's hard because the block is so small. I think that's why it's hard.

Students: [crosstalk 00:39:45]

Student: Not that I'm making excuses.

Teacher: I agree with you "student". Is that why, because you're Asian? [00:40:00]

What other patterns did another group find? "student", what pattern did you guys find?

Student: We found that the tides go high, low, high, low.

Teacher: They found that it goes high, low, high, low. Did it ever stop into going high, low, high, low.

Student: No.

Teacher: No? That continued. What else? "student", what did your guy's group find? "student", what did you guys find? One pattern.

Student: Every other week, the tides are almost the same.

Teacher: Every other week?

Student: Yeah.

Teacher: That's very good. Any explanation to that? Why would they be similar every other week?

Student: Because it takes one week to go around. It's high tide on each side. This is the earth, and the moon's over here it's high tide and when the moon's over here it's high tide.

Teacher: Very good, "student". Okay, I'll see you guys on Tuesday.

Student: Bye teacher.