

25: 8th_Science_Tides_Classroom

Teacher: Alright, did you guys all copy your homework?

Group: Yes.

Teacher: Okay. So it's the same thing as yesterday, page forty-four in your notebook. If you're not done, that the construction paper one, make sure you finish that up by Tuesday. I don't see you guys on Monday, so, if you want to come in for study hall, that's fine also. Okay? Today we have a whole bunch of things going on. We're going to finish up your ... Well, we're going to at least work on a little bit of your Cornell notes for tides. We're going to get into that blue paper, that we set up yesterday, on Spring leap tides, and, we will have time to get into a tide calendar. Okay? So first thing we'll do, is give you guys about eight minutes or so, to finish up your Cornell notes from yesterday. How far did you get? About half way?

Group: Yeah.

Teacher: Okay. [inaudible 00:00:44] seven minutes. We'll try that. If you guys are finished, you can start reading page twenty-seven. Which is what we're going to be doing today. You have one question? Okay, you've got about three and a half minutes left. I feel like most of you guys are almost done up to the summary. I'm just curious, can you guys hold up about how many minutes you need, zero, one, two. [00:01:58] [inaudible 00:01:58] three [00:02:00] minutes. Why are you guys all quiet in here?

Student: I know it's like ...

Teacher: [inaudible 00:03:27] Okay, you guys have two minutes left. If you're done, don't forget, start reading page twenty-seven, because, that's what today is all about. If you're done. "student", you said me.

Student: Okay.

Teacher: "student", tell us, how is the book defined for tides.

Student: They're rising and falling of the ...

Teacher: Whoa, we're getting a lot of different kinds of answers. Let me rephrase that. How many types of tides can you get throughout the day? [inaudible 00:03:51] [crosstalk 00:03:51]. How many high tides will you get a day, typically?

Group: Two.

Student: One.

Teacher: [00:04:00] We get two. [00:04:01] Typically, you have how many low tides?

Group: Two.

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

Group: Six.

Teacher: Let me rephrase that. If you have two high tides, two low tides, and they all occur in one span of twenty-four hours, about how often does it change? Six hours. Every six hours, you're going to have a high tide, you're going to have a low tide, you going to have a high tide, you're going to have a low tide. Pretty constantly. Okay? Who else should I pick on? Anybody else need a break? Explain to us ...

Teacher: How do we know that?

Group: It's orbiting.

Teacher: We're stuck in the orbit. That's correct. Now you just told me that the moon, also, exerts gravity on the earth. Which one is stronger?

Student: Sun.

Teacher: Is it going to be the sun or the moon?

Student: Moon.

Teacher: What do you guys think?

Group: Sun.

Teacher: Why the sun? Why the sun “student”?

Student: It's bigger.

Teacher: It's bigger. However, the moon is actually, pulling stronger. Anybody have any idea why?

Juan: Is it because it's closer?

Teacher: It's closer. The moon is actually sitting closer ... It's okay, you didn't know that? Yeah, that's on the next page. 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 is actually coming from the moon. Does that mean low gravity is coming from the sun?

Group: No.

Teacher: Alright, you guys can go. I'll give you about five minutes. We're following page twenty-seven. Can you help her set that up? Why are you guys so quiet on the days you supposed to be talking?

Student: We're always quiet.

Teacher: Right.

Student: [00:06:00] Sometimes. [00:06:01]

Teacher: Did you guys all find the definition of Spring tide?

Group: Yes.

Teacher: It should be something along the lines of maybe, greatest differences of something. Right? Hopefully.

Student: Our phase is [00:08:00] a little difficult then these yeah?

Teacher: A little bit. [00:08:18] You got to think, that's where are discussion might come in handy. Hmm. I would agree with that.

Group: [crosstalk 00:08:22]

Teacher: So think about what it means. What is different [inaudible 00:09:19] high tides. That would be really low, and, [00:10:00] really high. How are we doing on [inaudible 00:10:08] alright?

Group: Yes.

Teacher: [00:10:50] Most of you guys almost done with definitions [inaudible 00:10:50]?

Group: Yeah.

Teacher: [inaudible 00:12:18] You guys are on a minute. Okay. One minute. Get as much as you can done in one minute, and then, we'll go over it. Don't freak out. We'll get it in there. Range [inaudible 00:11:03] It's not a low range, but, a high range. Write it down. [inaudible 00:11:36] [00:11:36] I know you guys [inaudible 00:11:49] definitions, but [00:12:00] do you understand the definitions?

Group: Yeah.

Teacher: Okay good, because, we're going to talk about it. ... They're specifically showing you [inaudible 00:12:35] position. Spring tide is on the top or the bottom?

Group: Bottom.

Teacher: On the top. Are the earth, sun, and moon in a straight line?

Group: Yes.

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

Group: Yes.

Teacher: Yes. Earlier, you told me, that it's the force of ...

Student: Gravity

Teacher: Gravity that's causing tide. Okay, but why? Where is there a high tide? Why is there a low tide? I told you that the greater force comes from the?

Group: Moon.

Teacher: Moon. Right? If I do it this way, what moon phase am I in?

Group: [crosstalk 00:13:08]

Teacher: New moon, right? So what direction of the pull of gravity, is acting on the earth right now? Where is it going? Point to the direction that the force is. Look at it. If the force of the sun and the moon, are pointing on earth, which way is our [inaudible 00:13:23] pull? Point to that direction. It should be going this way. Right? If the earth is being pulled this way, what will happen to the water?

Group: [crosstalk 00:13:31]

Teacher: Will they come with earth?

Group: Yes.

Teacher: The water would actually be pulled before it's actual [inaudible 00:13:35]. Right? It's fluid. It's a liquid. It will be pulled this way. What's going to happen on this side of earth? High tide, low tide?

Group: High tide.

Teacher: You'll have a high tide. Okay, if the forces are coming 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?

Student: The water that's over, flows to the opposite side of where the moon and the sun are.

Teacher: [00:14:00] Very good. It's low tide. [00:14:01] Your taking the from one area and moving it. All the water is being moved. You have your low tide on the side. It all turns on earth. How many high tides do you have?

Group: Four. Two.

Teacher: How many high tides do you have at all times?

Group: Two.

Teacher: You got two. One of them [inaudible 00:14:14] when the moon is pulling, because that's the stronger pull. The other is on the back side. You also have how many low tides every day?

Group: Two.

Teacher: At all times. About two. Okay? Cool. Any questions on that?

Group: No.

Teacher: Negative. Alright. 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?

Student: Yeah.

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

Group: Moon.

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

Group: [crosstalk 00:15:11]

Teacher: The moon's orbit takes one month. Remember? ... This is an example of a blow up version of two days in a tide calendar. If I mention that we're going to be looking at tide calendar today, it's a typical, twelve 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 thirty of these little blocks. This is ... I think it's December 30th and 31st. This is ... I have this year's calendar, so it's 2015. There are a whole bunch of things going on in here. Can you guys read the numbers in the back?

Okay. Let's talk about what's on here. First off, let's go on this side. First off, on this, you have a moon key. Which tells you [00:16:00] what does this represent?

Group: Moon phases.

Teacher: Moon phases. Okay? You have a full moon represented by colored in yellow. New moon is pretty much a blank circle. Everything in between is going to be partially shaded in.

Alright? Your moon phases are located here. If you look up on this picture, your moon phase is there. Okay? You also have a sun. It's kind of hard to see, but, there's a sun on every day, and there's an r and an s. What does r and 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?

Group: Six.

Teacher: Six o'clock.

Group: Six, o one.

Teacher: Six o one. There different. It should give you a hint as to, if you look at pattern, maybe you, following this. Okay? Your moon is right here, the visual of the moon. The moon also has an r and an s. Does the moon also rise and set?

Group: Yes.

Teacher: That's true. Why is that?

Student: It goes around ...

Teacher: Why does the sun rise and set first? Is it because the sun moves?

Group: [crosstalk 00:17:06]

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, so, the moon also rises and sets. You have times that are, a little bit different than a sunrise and sunset. Okay? You have an h and an l. What do you guys think that means?

Student: High and low.

Teacher: High and low tide. Remember there are two high tides in a day, around, and, there are about two low tides in a day. It tells you exactly what time it occurs, and this is the height. Okay? This one is occurring at 12:50 PM, about .6 feet high. The low tide is 6:37 and a negative .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. Okay? This is basically a graph. Your time throughout the day is here, this is twenty-four hours, twelve noon is right in the middle, and as you're moving along, your tide is fluctuating. [00:18:00] why isn't it a straight point? Somebody tell me.

Group: [crosstalk 00:18:09]

Teacher: Why doesn't it just take a sudden turn like that?

Student: It takes time to do ...

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

Group: 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. Okay? What you have here, is a plotted dot of your high tide. Your high tide is, see, it's at 1:39 AM. It's at 2.3 feet, so it's going to be plotted right around there. Okay? We can't see it. The height is on the left side. This is the two foot line right here, one foot zero feet, so, your 2.3 is right around there. Your next low tide will be about how many hours away?

Group: Six.

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

Group: Six hours.

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

Group: Yeah.

Teacher: It's going to go on forever, and ever, and ever. Okay? On our calendar any way. Alright? That's basically all that happens in this chart. Do you guys understand what's happening in the block?

Group: Yes.

Teacher: You sure? Any questions on what these numbers mean? Good point. No questions? Okay. Good.

Student: Wait?

Teacher: Yes "student"?

Student: You said there's two high tides and two low tides in a day yeah?

Teacher: Yes. About.

Student: Then ... Oh never mind, I see it. It took me a while.

Teacher: Okay, [00:20:00] the person at you table, that has [00:20:07] the first hair. You are the recorder today. You are writing on that paper. Please put whomever names on there. Open it up. Start looking for some patterns. If you guys [inaudible 00:20:20] calendar let me know. I have one extra.

Group: [crosstalk 00:20:25]

Teacher: Everything I just talked about, you have your sunrise, sunset, and moon rise and moon set. Alright? Okay, so, you are looking specifically for a pattern. You all know what pattern is right?

Group: Yeah.

Teacher: Things that constantly change. Well look for it [inaudible 00:21:22]

Group: [crosstalk 00:21:11] [00:22:00]

Teacher: Patterns. [crosstalk 00:21:57] [00:21:57] [crosstalk 00:21:57] It's a pattern. [crosstalk 00:22:04] How is this guys, difficult? Is this difficult guys?

Group: Yes. Kind of.

Teacher: Okay we're going to wrap it up. What I want you to do, we're going to [00:24:00] continue this on Tuesday, so I want you to hold your tide calendar ...

Student: If I don't ...

Teacher: Every other week?

Student: Yeah.

Teacher: That's very good. Any expectations? Along with the exception of every other week.

Student: It [inaudible 00:25:06] one to go ... So when ... This is the earth, and we look over [crosstalk 00:25:14] the moon's over here.

Teacher: High tide. Very good. You got it.