00:00 Flip your paper. Make sure you have a good space. I want you to use these methods you showed incredible mastery of.

00:15 The idea that seconds, number of seconds, if all equal, we could look at the beans and determine a winner.

00:25 Or if we had the beans, if they are all equal, we could look at the seconds and determine a winner and I have to point out Emily's great statement.

00:33 It says, "In seconds per bean we want less seconds." And in beans per second we want more beans.

00:40 So now I'd like you to look at this.

00:48 So here's new data comparing steps, remember Mr. Condon running back and forth? And time. It wasn't funny.

01:00 So Joe takes sixteen steps in ten seconds. Sarah takes thirty-two steps in twenty seconds and in fifteen seconds, Alex again, walks twenty-one steps.

01:17 On your paper I want you to try all three strategies and convince us who is the fastest stepper. O.K.?

01:27 Let's do this. Let's do a quiet work time for about five minutes and then we are going to do full discussion in your groups and share out as a whole. O.K.? Five minutes.

01:38 What is the process? You don't have to have finished but what process have you chosen?

01:43 Well Sarah, I think wins, because if she takes twenty seconds to take thirty-two steps and Alex takes fifteen seconds to do twenty-one steps.

01:58 Then because I didn't know who won yet so I doubled it so Sarah got forty seconds in sixty-four steps and Alex got forty-two steps in thirty seconds.

02:18 So I think Sarah is the winner because Sarah only had ten seconds more of a lead than Alex.

02:30 I think Alex won because I made their times, ten seconds, twenty seconds, and fifteen seconds to the least common factor or something. I forget.

02:45 And made that to sixty seconds. Because all those numbers go into sixty. So for Joe he does sixteen steps in ten seconds.

02:56 So I multiplied ten by six to get to sixty seconds. And then since he takes sixteen steps you got to multiply that by six and that's ninety-six steps.

03:05 So he takes ninety-six steps in sixty seconds. And Sarah does twenty seconds so I multiplied that by three to get to sixty.

03:18 And then I multiplied her steps, which was thirty-two, by three to also get to ninety-six so they are like the same exact thing and then…

03:29 Alex he does it in fifteen seconds and fifteen times four gets to sixty. So I did his twenty-one steps times four so that gets…no wait…Oh no I did that wrong.

03:52 I don't know why but I thought he won and his steps times four gets to forty-four.

03:58 So Joe and Sarah are tied for the most steps. So Alex lost for sure. But they are tied.

04:14 So who do you think won?

04:15 Joe and Sarah because they are equal.

04:24 Since I got thirty…forty seconds for Sarah and she took sixty-four steps. So if Joe takes ten seconds in sixteen seconds…

04:38 then you have to multiply ten seconds by four to get forty seconds so then you have to multiply sixteen times four and since Sarah took sixty-four steps…wait.

04:58 I did unit rate to find the steps per second for Joe, Alex and Sarah. And for Joe and Sarah they both got one point six steps per second.

05:17 And for Alex he got four steps per second.

05:24 Mine is kind of like his except what I did was subtract the steps by the second to see how many numbers they are apart.

05:34 And it ended up that Alex end up to be faster than everybody.

05:43 How is that? Does that make sense to you? So you did the unit rate first off also.

05:52 So the second thing you did was compare them based on the number of seconds which is poster number one, right?

06:01 I'd like you both, together, to compare it based on the number of steps. O.K.?

06:12 Each of their rates based on an equivalent number of steps. Without using the unit rate calculations. O.K.?

06:22 So kind of the same approach you used for the seconds but I want you to talk back and forth so both of you have a clear understanding. O.K.?

06:30 What did you just do here?

06:36 Steps per second.

06:37 You didn't do per second. You did steps in…

06:40 Twenty seconds.

06:42 So all of your seconds here: twenty, twenty, twenty, were the same. Right? So that was a legitimate way to compare it.

06:50 Now I want you to use the steps as a comparison. All right? O.K.? Talk back and forth Kendrick. Don't bury yourself in that just yet.

07:00 …in twenty seconds and that's the same thing except just Sarah does ten more seconds but it's the same amount of steps except that… Sarah just does more…

07:11 Because she has more time and Alex is slow because he only does twenty-one steps in fifteen seconds.

07:19 So you have to get the seconds to sixty so Joe was tens seconds so you've got to multiply that by six.

07:30 And then his step, which is sixteen, you've got to multiply that by six and you get ninety-six.

07:35 And then for Sarah she has twenty seconds at her base time. And then you've got to multiply that by three to get to sixty.

07:43 Then you've got to multiply her steps by three also to get to ninety-six so Joe and Sarah are tied.

07:50 Then you've got to multiply fifteen times four for Alex to get to sixty seconds and then you've got to multiply his steps by four to get to forty-four seconds.

08:03 I did the same thing except I stopped at forty seconds not sixty seconds.

08:09 So I got sixty-four steps in forty seconds instead of sixty seconds.

08:24 How did you know that Alex was slower?

08:25 O.K. I knew Alex was slower because I added up his time, too. So Alex got fifteen…wait. Yeah, if Alex got fifteen seconds in…..

08:44 Yeah, O.K. yeah. If you got fifteen seconds then you multiply that…Well, I multiplied it by four…sixty…so he got…

08:56 I thought you were doing forty seconds.

08:58 Yeah.

08:59 Yeah. Not sixty seconds. You've got forty.

09:07 You said you were doing it in forty seconds but then you said you multiplied by four to get to sixty.

09:14 I know. You get sixty seconds.

09:16 But you said you were doing forty seconds.

09:19 No. O.K., it took him sixty steps. He got sixty steps when the others got sixty-four steps. And he got that in forty seconds.

09:31 Alex got forty-four seconds, forty-four steps in sixty seconds so how could he get sixty steps in forty seconds?

09:38 O.K. he got…oh wait…oh wow…I got that wrong. So how did you get it, Michael?

09:55 O.K. Well, I already explained that to you I believe. Yeah, like four times. So, I multiplied the seconds to get to sixty…

10:06 And however many that was I multiplied the steps by that and that's how many steps they took in sixty seconds.

10:20 I get what you are saying.

10:23 Let's say there was another runner stepper or another stepper…Let's say her name was Zoe.

10:38 She ran for the same time as you.

10:54 So who do you think… Would you win or would she win?