HS.ALGEBRA.INTEPRETINGGRAPHS.FATHERSON.JKD

SUMMARY KEYWORDS
graph, accelerating, meters, son, constant rate, father, constant speed, distance, graphs, pace, happening, running, increasing, common errors, stay, y intercepts, started, occurring, faster, race

Teacher: 00:07
Class, we've been exploring graphs. Today we're going to look at a distance time graph and write a story about what it shows. The story is about a father and son and a 100-meter race, what I want you to do is write a story that matches the graph, be sure to include what is occurring at A, B, and C, as well as the intervals in between. Go ahead and get started.

Teacher- 00:30
So, what are you doing?

Student 2- Right now we're, we found out the father's coming ahead, start at 20.

Teacher- Okay

Student 2 - The son is gonna start at zero for eight. So, they're gonna end up meeting comments at four minutes, right? Yeah. For what, four minutes?

Teacher- Okay.

Student 3- And that's when the sun starts to go faster. And the father said, slow down a bit.

Teacher- So you guys agree the son starts to go faster at that point?

Students 2 and 3- Yeah.

Teacher- Okay, thanks.

01:32
Teacher- So where are they when the race starts?

Student 4- Zero.

Teacher- Do you agree? The father and son are at 00. Zero what?

01:40
Student 4- Meters? Yea meters?

01:44
Teacher- Where are they? At C?

01:48
Student 5- 95 meters?

01:51
Student 4- They're at separate.... They're separate, but 10 seconds.

01:57
Teacher- Interesting. Okay, thank you.

Teacher- So where are you?

02:03
Student 6- Um, the son was accelerating faster than the father.

02:07
Teacher- So what are we talking about with accelerating? Like, wait, so you said that's what you want to know, then you got a question to ask. You can ask your group.

02:17
Student 6- Because everybody keeps saying accelerating, but I don't see where it's accelerating. I get that it's reaching their distance more, but I don't see. I mean, I think they're keeping their constant pace, 10 meters in one second.

02:35
Teacher- So is the sun accelerating?

Student 6- I don't think so...

Teacher- Does the father's pace change?

02:45
Student 3- No, no.

02:46
Teacher- How do you know what in the graph tells you that?

02:50
Student 3- It's like a pattern with the son. Like, every like two seconds, he goes to like 10? Well, it seems like 10 more meters,

02:58
Student 7- It's a straight line. If we would be accelerating, the line wouldn't be like that. It is more accelerating at a certain point; it would go up more.

03:09
Teacher- So what does she mean by that? Like, I want someone else to say it, I know what you mean. I want to see what someone else

03:15
Student 6- Like I don't know. I'm kind of confused.

03:17
Teacher- Okay. So ask the question.

03:19
Student 6- So like, like after they hit like the four seconds, I guess, like everything mixed up? I guess, like the son start? Well, I think the son started running faster. And then like the father started. You know, um like jogging. I guess.

03:32
Teacher- That's an interesting point. We're going to talk about that as a whole class.

03:37
Teacher - Okay, class come on back.

03:42
Teacher- What was happening at the start of the race? Yes.

03:47
Student 8- They both started at the tie zero. But at the meters, the dad was ahead 20 meters.

03:53
Teacher- What about the graph told you that?

03:55
Student 8- The fact that started like higher than the son's. It doesn't point to .... the zero.

04:03
Teacher- So you're talking about these points on the graph. So what do we call what's occurring at A?

04:11
Teacher- Yes

04:12
Student 9- The y intercepts.

04:13
Teacher- So what's happening at B on this graph? What's happening at B?

04:18
Yes

04:19
Teacher - This is the intersection where the Father and the Son are at the same distance and the same time.

04:27
Teacher- Got it? Thank you.

04:28
Teacher- I've got a different question to ask, though. Because we had some interesting discussions at the table about this one.

04:35
Teacher- What is happening with their speeds?

04:40
Teacher- Yes

04:40
Student 11- They're increasing

04:41
Teacher - Who's increasing?

04:43
Student 11- The father and the son?

04:46
Teacher- How do you know?

04:47
Student 11 - Because the graphs on the lines are going up.

04:49
Teacher- And that indicates that they're increasing in the speed.

04:53
Teacher- Agree or disagree?

04:55
Student 9- I disagree with that.

04:57
Teacher- Why?

Student 9- Because they both remain at a constant speed, they don't increase, I guess. They do increase by the distance but not the time.

05:10
Teacher- The time is standing still.

05:12
Student 9- It's hard to explain

05:14
Teacher- Try, it is hard to explain.

05:17
Student 9 - Okay, they do stay at a constant rate of speed because he doesn't slow down, nor does he stay in the same place, he just keeps going at a two second, per 20 meters.

05:31
Teacher- So let me ask you a question just about the son, then. Is there a place during this race, you could find that the son was running at a different rate?

05:39
Student 9- No.

05:41
Teacher- Why does she say no?

05:42
Student 12- Because the graph stays constant. There's no different direction, it doesn't become more steep or more lower, it stays at a constant rate. So, you can see that this son is running at 10 meters per second. And the father is running at a constant speed of five meters per second.

06:06
Teacher- So what is your thinking about this? Now

06:08
Student 11 - They're going at a constant speed, but they're still going up. They're still so what's the, they're running farther, but They're going the same pace.

06:18

Teacher- So what you just identified is a common misconception. We look at the height of the graph. And we think that that means that this distance time graph is telling us that someone's going faster and faster and faster, but it's not changing the speed, what is it doing?

06:33

Student 11 - The distance is changing.

Teacher- Got it.

06:35

Teacher - Thank you. Class. You address some common errors that we have in interpreting graphs and parts of graphs. Nice work making sense of the situation.