Toy Car NGSS Video Transcripts

Video 1

Carolyn: I wanted to throw out another idea today.

Adrian: I have a car like that.

Carolyn: Now this is an interesting homemade car.

Adrian: Oh, I know how to do that.

Carolyn: What do you think about this? Now just stop and think for a second. And just look at it. Just look at it... OK. Listen to what Adrian's ideas are. I want to hear your ideas.

Adrian: If you twist this thingee, or, yeah, pretty much that way, like you just keep twisting it, until like this, you just keep twisting it till like it wants to turn one way. And then, like, and then you let it go, and then it just goes like that, and you push it. But you have to wind it up a lot more. ... (break)

Adrian: [finishes winding up propeller] Now that's good.

Carolyn: Okay. Okay, now what I want you to do is just let it go and let's see what happens (propeller turns fast). What did you feel, what did you see?

Adrian: Like, it was spinning so fast--

Student: Let's do that again!

Adrian: And in the wind, the force of this thing pushing it, the wind could have like shot it out that way, it would suck it into this way, shoot it out that way, and it would go [points with his hand].

Video 2

Carolyn: Let's see, if I'm going to set this down like this. (Student: You need my help?) Yes, with cooperation. (Student: Oh.) So if I set this down now, which way will go better? (Car moves forward).

Class: Yay.

Adrian: Barely.
Carolyn: Oh, it moved a little. It moved a little. OK, let's stop and think for a second. Okay, let's stop and think. We got it to move, remember that was our thing, how do you get a toy car to move?

Carolyn: ... I want us to stop and think. What is going to be the best conditions? What do you think? Several people came up and said, 'I think we ought to do this, I think we need to use cardboard, Oh, I think we need to do this.' We already came up with a way of twisting this going another direction. Tell me what you think the best ways to get this type of a car with our propeller to move? How do you get this toy car to move? You might want to draw a little picture, and I'll hold it up so you can quickly get an idea. What could we name this one?

Adrian: Propeller.

Carolyn: Propeller car? Okay. (Cut in video)

Carolyn: ... What do you think would be the best conditions, or what would I need to get this to go, faster or further? (turns propeller).

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**Video 3**

Carolyn: Janet, what were you going to add?

Janet: Um, if the wind will go, if you already winded it up on a windy day and then it would, it won't push anything, but if it was like right in front, right in back of it, it might make it go a little faster if it was right here.

Carolyn: So you're saying, if the wind, did everybody hear what Janet just said?

Class: Yes.

Carolyn: She's saying like if the wind was over here on the back of it?

Janet: No, actually like a little bit, a little bit back.

Carolyn: Come up and show me. She's saying that maybe it could help. Where the wind is coming?
Janet: The wind is coming like here, and then it might make it go a little faster, but it won't wind it.

Carolyn: Ohhhh, you're thinking that the wind will make it go faster, but you agree with them, it won't wind it.

Adrian: It won't wind it as it's coming from the opposite way. If the air, like, if it's coming from that side, it won't go. It would just go from the fan. Like, the propeller, because this part, like if it's coming from the back, when you let that go, that would just push all the air that way. And, like, but if the air is coming from this way, then it would suck the, the, like the wind in that way and then push it out that way and then make it go faster (points). So that's why from the back it wouldn't work.

Video 4

Carolyn: All right, today I want to hear what you wrote down in your journals. We were talking about, what would be some good ideas. Xinru, do you want to read what you wrote?

Xinru: On the propeller car?

Carolyn: On the propeller car, yes.

Erica: Oh, I know.

Carolyn: Hold on, let's listen to what she's got.

Xinru: The propeller car won't work to go on the carpet because the carpet is too thick and it is a better way to put the propeller car on the table or cardboard. It will work because it do not have bumpy road and a carpet has a bumpy road.

Carolyn: Okay, she talked about that. And had we tried that yet?

Xinru: No.

Carolyn: No, we don't even know this is for sure yet, but she said that by putting it on the carpet and taking it off the carpet, it might work better. Adrian, what did you write?

Adrian: Um, I just pretty much drew.
Carolyn: Okay, but explain to us, that's okay, you can do it in pictures, just explain to us what you did.

Adrian: Here's the car, and you can put it down a ramp, like just hold it down a ramp, and then you twist the rubber band until you see like little knots, but not like tight knots, just like little knots that means it's getting real tight like the band is twisting up.

Adrian: And you put it on a wood floor or a desk, and it's a flat surface now.

Carolyn: Okay, you said the wood floor or desk, why would that be different than the carpet?

Adrian: Because, like, the carpet is more bumpy and it's like... like the wheels can sink like into the carpet and get stuck.

Video 5

Carolyn: We talked at length yesterday and some of you recorded it. Why do we think it didn't go very far? Why do you think it didn't go very far? Jamilah.

Jamilah: I don't think it went very far because it didn't have a flat surface, because this is bumpy. But if you try it out on anything that's nice and smooth ... it will go on this. But it won't go on anything bumpy, because in a way, it will just go like this: (moving hand forward, going up and down).

Carolyn: Okay ... That was one of our challenges on getting this to go faster and further. Why do you think it's going to go faster on here? (Indicates smooth table) Why, Erica?

Erica: Because there it's smoother and the carpet has bumps.

Carolyn: All right. Why do you think, Hannah?

Hannah: Um, this one's smooth and that one's bumpy. Like, when you turned on that other car, on that ramp, it was a bump on (the bottom). It just went down and it stopped.

Carolyn: Okay, so do you agree with Erica? (Hannah nods.) What do you think, Andy?
Andy: On the floor it has bumps and it will go slowly.

Carolyn: And so there's bumps, and that's what Erica said. What do you... Adrian?

(break)

Adrian: ... catch it. But like if you, uh, like roll it on the rug, it's like sorta deep and there's, like, knots in it and so the thing, the wheels will get caught in the rug. But up on this surface, it's like not flat, it's like more smooth than the carpet, so it's definitely better.

Carolyn: Okay, you said it's 'definitely better.' Why would being smooth be better than bumps?

Adrian: Because bumps would slow it down.

Carolyn: Ohhhh.

Adrian: The wheels are too small.

Carolyn: The speed would be affected?

Adrian: Yeah.

Video 6

Carolyn: ... on a surface--

Jamilah: Turn it, turn it backwards.

Carolyn: On a surface that has, um, uh, bumps, which would mean it would have a lot of what?

Hannah: Friction.

Carolyn: Friction. (pause) Which way should I let this go?

Johnnie: Turn it around.

Carolyn (orienting car): Turn it around this way?

Class: Yeah.

Carolyn: So if I place it down here on this and I --
Student (shouts out): I want it to be longer!

Carolyn: We're gonna put it on the bumpy one right here, let go and...
Which way should it go?

Students (pointing to the left): That way.

Carolyn: It should go this way? (Releases car, and it goes forward.)

Class: Yay.

Carolyn: Okay, now look. This is where it went on the carpet. Now I brought in some other--

Adrian: Get the ruler!

Carolyn: Oh, and I have to see it again. (break)

Carolyn: ... All right. So now, refresh my memory again. Oh, okay. What do you think we should do? All right.

Student: Hold it down.

Carolyn: Okay, now. Which way is the car going to go?

Adrian: Backwards.

Carolyn: This way?

Adrian: Yeah. Go backwards.

Carolyn: So, if I'm gonna start it right here... All right. Let's see what happens. Watch out, Johnnie. Let's keep... Just put your fingers there. (Management issue.)

Carolyn: Okay, so if I ... Need a countdown.

Class: Three, two, one. (Carolyn releases car, and class reacts to car's motion)

Adrian: It went further than before.

Carolyn: So it did go further.

Carolyn: Why do you think it went further?

Erica: Because, because it--
Carolyn: Why, Erica?

Erica: Because there wasn't any, like (unintelligible), and there wasn't any friction. It was, there was ... (other students talk in background)

Carolyn: Wait, wait. I can't hear Erica. (Class quiets) Sorry, Erica.

Erica: There wasn't any, there wasn't any friction, and was therefore smooth. And the carpet was (bumpy).

Video 7

Carolyn: Probably (we) should count it. How many times?

Student: Twenty!

Carolyn: But we can get... Daniel kind of figured it out. Daniel, what did you say about the rubber band?

Daniel: Um, if you do it stronger, like, um, if you spin it more and more and more, then it will go like, um, it will go faster and farther.

Carolyn: So, the more I spin it, that affects it as well. That was a condition that we talked about. Yeah. What else, Hannah?

Carolyn: Now. Let's try this. What do you think? What do you think, Eric?

Eric: Um. (Lots of class talking.) If you wind it more, if you wind it more, it will go farther.

Carolyn: Oh, now, did you hear what Eric just said? He said, "If you wind it more, it will go farther."

Hannah: And faster.

Carolyn: And faster? Hannah says, "And faster." Do you agree?

Adrian: Probably not faster. It'll be probably the same speed, but just farther.

Eric: Yeah, because it has... because it has more...
(Lots of students talking.)

Carolyn: All right. Let's set it down. This will be kind of our last test for today. But let's see what-- oh, wait! No, wait, (there's) one other thing we want to test. Okay, I need... There's a lot of them in there, isn't there? All right, I need a countdown.

Class: Three, two one. Whooa! (Car moves forward.)

Class: (talking about the propeller car test)

Carolyn: Oh, interesting.

Video 8

Hannah: Um, I remember when we tried the other cars, went down the ramps, that, um... It's kind of like better than like, just like, (unintelligible) because if you have a ramp, .... If you have a ramp, then, um, the speed of the ramp adds to the speed that, um, that, um, the propeller is making the car go. It will go together, and it will go faster.

Carolyn: OK, but what did we learn about ramps?

Adrian: That ramps are better than just flat surfaces.

Carolyn: Okay. We learned they were better than just flat surfaces. (class crosstalk)

Carolyn: What did we learn about this kind of a ramp?

Adrian: Definitely not going to work. (More crosstalk)

Carolyn: (to Hannah) Wiat, you're in the way of Xinru. (To Xinru)

Xinru, what did we learn about this kind of a ramp?

Xinru: It's like going down(?)--

Hannah: It's too steep.

Adrian: It's going to go like--

Carolyn: Wait. Xinru.

Xinru: It's too tall and it's like going down so--
Carolyn: All right. It's too...

Xinru: Steep.

Carolyn: What did we learn about, maybe, this kind of a ramp?

Adrian: Too low. Too low. (Students: Too low.) (crosstalk)

Carolyn: So, who's got an idea about a ramp in order to test this?

What do you think, Carolina?

Carolina: (She sets up ramp) It's like, if we, um, put it, put it like this. And then, and then when we put it down, it would be faster than the ones we used to test. (Break in video.)...

Carolyn: All right. I need a countdown.

Class: Three! Two! One! Liftoff! (Crosstalk as class responds excitedly to test)

Carolyn: OK. So now, we're going to set this down, and I just let go. We're just gonna try it to see ...

Class: Three, two, one! (Carolyn releases car, and class reacts.)

Carolyn: All right, interesting. We did it.

Alec: You have to blow it more. Student: We need to blow it more so it goes farther! (break)

Carolyn: Excuse me, Annie. Carolina?

Carolina: Maybe you could like ... blow lots of air and, in the car and the balloon, and then it will get stronger and faster and stay spinning, plus it'll go really fast.

Carolyn: Oh, wait, you said ... it's gonna go faster with more air? (Carolina nods.) Alec, what do you think?

Alec: I think you at least need to get the balloon ...

Carolyn: Just a moment.
Alec: I think at least need to get the balloon like this big (holds hands far apart) or that big (moves hands closer together), or at least go far.

Carolina: It'll pop!

Carolyn: All right, are you saying here ... Alec, you're agreeing with Carolina? Carolina said if there's more air, it's gonna go faster.

Alec: It gives it more, it gives it more power to push it farther.

Carolyn: And further? Erica says further?

Carolina: I don't mean REALLY big.

Carolyn: All right, let's try it. Hannah? (break)

Carolyn: We know that air does, we discovered that, but what is happening? What's happening, Johnnie?

Jonnie: What's happening is that, like, the air's pushing it ... when you push it, the air's going this way (indicates a direction), so like when you're gonna go, air's going this way (indicates opposite direction) so that it's going actually backwards out into the wind. Out right into the wind. (break)

Carolyn: Okay, so the air is pushing -- (break)

Carolyn: Johnnie said the air was pushing it. Andy said the air was pushing on it. What is the air pushing? Because when I blew it up, when I blew it up air was coming out but I don't see anything here that it's pushing.

Eric: The air that's in the balloon...

Carolyn: Okay. I'm gonna put some air in the balloon.

Eric: ... um, hits more air that's heavier than it.

Carolyn: Where's the heavy air?

Eric: Behind the car.

Carolyn: Okay. So there's air here?

Eric: And it's pretty much everywhere.

Carolyn: Okay. So--
Eric: And the air that's hitting it, the other air is pushing it forward.

Carolyn: The air that's pushing the other air is...

Eric: Propelling the car forward.

Carolyn: Propelling the car forward. What does 'propelling the car' mean?

Eric: It means like to make the car go forward.

Carolyn: Oh, okay. Because this was a propeller-- (break)

Carolyn: These two cars --

Hannah: --have something in common.

Carolyn: Have something in common. Because why?

Hannah: Because the balloon car has, it has ... When you blow up the balloon in it, it goes, just like the propeller car, when you wind it up it'll blow once, and then it blows air, just like the balloon car.

Carolyn: Oh, they both blow air.

Hannah: A little bit of air.

Carolyn: And, do they blow it where?

Hannah: In the back of it.

Carolyn: In the back of the car...

Hannah: It's making like it... it's like pressure on it.

Carolyn: Oh, it's got some pressure on it? (Hannah nods.) Okay. Anybody else have anything to add about these two cars ...?