



Challenger's Morning Science Segment:

December 25, 2017

Topic: The Polar Express Experiment

Build: Ice Ramp

Credit:

<https://literacyandlattes.com/2016/11/02/winner-wednesday-polar-express-science/>

Materials Needed: 2 baking sheets / water / toy trains with moving wheels [can use cars instead]

Two experiments: In the movie, *The Polar Express*, the train goes out of control on the frozen lake. You will investigate icy conditions as part of the Polar Express experiment. Start by freezing water in two baking sheets overnight. The following day, remove the ice sheets from the baking sheets (this can be done by flipping the baking sheets and running warm water over the back). Once removed from the pans, you will take the two ice sheets and setup the ice test track.

Angle the first ice sheet as a ramp by propping it up by at least 6 inches. Align the second ice sheet as a flat "road" at the bottom of the ice ramp. The test train (or car) should be able to be released at the top of the angled ice sheet and continue down and on to the second ice sheet. Next, set up the emptied baking sheets, upside down, in the same configuration beside the ice sheets. Test the train (or car) by releasing it onto the smooth metal surface of the angled baking sheet and watch it roll down and on to the second baking sheet road. On which surface did the train travel the further?

The science: [<http://dujs.dartmouth.edu/2013/04/what-causes-ice-to-be-slippery/#.Wckk4dFrzIU>]

Ice has reduced friction with an object because of a thin layer of layer of liquid. "Surface melting and the creation of a liquid-like layer on ice gives ice its slipperiness. However, it is also important to realize the importance of pressure melting and frictional heating on ice. Both of these processes can develop true liquid layers on ice." The train should travel further on the ice's surface because of reduced friction.

Upcoming at the Challenger Learning Center of Maine: Challenger's 5K Space Race is set for March 31, 2018 and registration is open. Begin your race season with a great race right here in Bangor. New this year is a reduced price for youth. Sign up early to get a pre-registration discount. FMI-

www.astronaut.org