Students could be asked to predict the relationship between the angle of the runway and the amount of splash. (They might even measure the coefficient of friction by measuring the angle (θ) at which the cart starts to roll on its own, i.e. where \( mg \sin \theta = \mu mg \cos \theta \), when \( \mu \) is the coefficient of friction, and allow for this.)

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**TECHNICAL TRIMMINGS**

*Share interesting experiments, ways of demonstrating physics and pieces of apparatus that you can build.*

### Observation of ice crystal growth

With their complicated structures and beautiful shapes, snow crystals will appeal to the visual sense of the student [1], as well as allow opportunities to study the physics of crystal formation and growth.

Earlier studies [2] employed elegant, though simple, techniques to learn that the habits (i.e. shapes) of ice crystals grown from the vapour are systematically related to temperature and humidity. The primary habits exhibited by ice crystals (plates and columns, see figure 1) are determined by the temperature, whereas various secondary habits depend on the supersaturation (i.e. the ratio of partial pressure in excess of saturation to the pipe and \( f \) is the resonant frequency. A suitable graph (for example \( f \) versus \( 1/L \)) yields the speed of sound—we made it 345 ± 3 m s⁻¹.

The ease of analysis makes this arrangement ideal for further investigations. The change in frequencies can be measured in other musical instruments—from milk bottles containing water (blowing over the top or using them as percussion instruments) to strings of different lengths and tensions.

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**Figure 1.** The two primary habits of ice crystal growth.