A Sweet Process

Think About It
White sugar, golden brown sugar, dark brown sugar, and molasses are all produced from either sugar beets or sugar cane. You might wonder how one raw material can be turned into so many different products. The answer lies in the processing.

What to Do
With a partner, examine the flowchart below that shows how various sugar products are made.

A. When the sugar cane is ready to harvest, the dry leaves are burned off. The stalks are transported to a factory.

B. The stalks are washed, chopped up, and then shredded.

C. The shredded cane is placed in scalding hot water to dissolve the sugar.

D. The sugar is heated and chemicals are added to help the filters remove impurities in step E.

E. Filtering removes the remaining shredded bits and impurities, and produces a clear solution of sugar in water.

F. Evaporators remove most of the water. This is similar to the process used in maple syrup production.

G. Juice leaving the evaporators is still too dilute. It is placed in a vacuum boiler, which removes almost all of the remaining water without making the juice hot enough to caramelize.

H. Juice leaving the vacuum boiler already contains a lot of sugar crystals. A centrifuge spins it at very high speeds, similar to the spin cycle on a washing machine.

I. The remaining liquid is spun off and collected in the molasses tank. The pale brown crystals of raw sugar are also collected. Both the liquid and the crystals are sent to a refinery for further processing.

J. In the refinery, the pale brown crystals of raw sugar are rinsed and dissolved in water. Then the solution is filtered. The water is removed once again by evaporation and spinning. Crystals of white sugar are produced at this stage. The liquid that remains is used to produce the various grades of brown sugar. The liquid from the molasses tank is processed to make several different grades of molasses.