

Making a Microphone



Stereo systems are expensive, so wouldn't it be great to be able to build your own components? Maybe you'd rather put together a public address system to deliver a message to a large, enthusiastic audience. These projects are too complex to complete in a classroom. However, by experimenting with a sensitive piezoelectric film called PVDF, you can design your own microphone.



Predictions

Read through the list of materials on this page and the steps of the procedures on page 13. Then predict how the flexible film will react during each of the four tests and how the rigid film will react during each of the four tests. Also predict how attaching a vibrating medium, called a substrate, to the film will affect the response of the rigid film and the flexible film.

Think about these questions as you do the activity:

- ? What is the difference between the way a microphone works and the way the human ear works?
- ? What variables influence the quality of sound this PVDF film can produce?

Design Connection Where could you use a smart sensor system that responds to sound?

► Make a chart with space to record:

- your predictions about how the four different setups of the PVDF film will respond during the four different tests
- reasons for your predictions
- your observations during the tests

► Gather these materials:

- two pieces of PVDF film—one flexible and one rigid
- substrate (a rubber or Mylar™ balloon, a rubber glove, plastic wrap, or any stretchy material)
- support for the substrate (a plastic or polystyrene cup) and rubber bands to secure the substrate
- amplifier with speaker
- connecting leads with alligator clips
- double-stick tape or a glue stick