

10.6 Singing pipe (Educational Innovations product)

Subjects: Properties of gases

Description: A metal pipe is held vertically and one end is heated with a burner for about 10 to 15 seconds. The vertical pipe will produce a loud tone for as much as 30 seconds.

Materials:

Singing pipe (Educational innovations product), with wire mesh

Burner*

Matches

*Shared item: Located in the top drawer opposite the storage shelves.

Procedure:

1. Light the burner
2. Hold the pipe vertically with the screen end at the bottom
3. Heat the screen of the pipe over a flame for 10-15 seconds
4. Remove from the heat
5. For 30 seconds, a loud tone is heard

Discussion:

The flame heats the screen at the bottom of the pipe. The hot screen heats the air inside the pipe, causing the hot air to rise and cool air to enter through the bottom. Because the air passes through the holes in the screen a turbulent flow is created and fills the pipe. The noise is produced because certain frequencies of sound from the turbulent flow of heated air resonate within the tube cavity. Turning the tube horizontally disrupts the flow of air and the sound stops. Rotating the tube to the vertical position returns the sound.

Safety: Use caution handling the pipe. The bottom nearest the flame can become quite hot.

Disposal: None

Reference:

1. Educational Innovations Inc. © #HS-14. Singing pipe.
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