

## **WHICH AMPLIFIER WORKS BEST?**

**A. Question:** *How can we amplify sound?*

**B. Materials Needed:**

1. A cheap polystyrene comb for each student.

**C: Procedure:**

1. Hold a comb in the air and pluck the teeth with your fingernail.
2. Ask students: "How can I amplify the sound?"
3. Hold the end of the comb against the table top and pluck again.
4. Distribute different combs to each of the students and let them try to hold against different material in the class and listen which of them gives the best amplification.
5. Point out to the students that the different lengths of the teeth give different pitches (simple tunes might be plucked by the teacher).

**D: Anticipated Results:**

Students should observe different amplifications when placing the comb against different materials.

**E: Thought Questions for Class Discussion:**

1. How did the sound get amplified?
2. Why do we hear the sound when the comb is held against other materials?
3. Which factors are influencing the loudness of a sound?
4. What material is the best amplifier for the comb?
5. What made the different pitches in the plucking of the teeth?

**F: Explanation:**

In holding the comb against the table top while plucking the comb's teeth, it was not only the teeth and the comb that were vibrating but the whole table top vibrated with it. This means an increased surface of the vibrating object, which is the main reason for an increasing loudness or an amplification. The factors that are affecting the loudness of sound are: 1. distance from sound source; 2. the amplitude of the wave, i.e., how hard the teeth are plucked; 3. the surface area of the vibrating object.

Un general, wood sheets and wooden boxes are the best materials for quality in sound amplification. This is why sound boards (for the piano), guitar and violin bodies, and speaker boxes are all made out of wood.