

I. Preparing your materials

material list

72 inches (183 centimeters) of class 200 - 3/4 inch PVC pipe

Duct Tape

Chip Board (.022 caliper - from cereal or soft drink boxes)

PVC pipe cutter (not a hacksaw)

Ruler Pencil Scissors Marker Pen

	<u>Fractions</u>	<u>Inches</u>	<u>Centimeters</u>	
C	1	12 3/8	31.4	1
D	8/9	11	27.9	2
E	4/5	9 7/8	25.1	3
F	3/4	9 1/4	23.5	4
G	2/3	8 1/4	20.9	5
A	3/5	7 3/8	18.8	6
B ^b	9/16	7	17.7	minor 7
C	1/2	6 3/16	15.7	8
optional Major 7th: B natural				
B ⁿ	8/15	6 9/16	16.7	Major 7

Step 1: Use your ruler and pencil to measure and mark your PVC pipe to the eight lengths on the right, i.e., C, D, E, F, G, A, B^b, C.

Note: Our music will not use Bⁿ (B natural). However, I have also listed it here for those of you who want your instrument to play the Major 7th in the scale.

Step 2: With a PVC cutter (not a hacksaw), cut the pipe at each mark. Twist the pipe a little to start the cut. Try to make each cut as straight as possible — straight cuts will produce tubes that are “in-tune.”

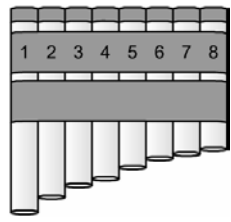


Step 3: Cut eight square pieces of duct tape. Each square should be 2-inches by 2-inches.



Step 4: Cut eight square pieces of chipboard. Your squares should be 1-inch by 1-inch.





II. Building your Fraction Tubes

www.philtulga.com

Step 5: Place a chipboard square on one end of each tube and cover with a duct tape square.



Note: The chipboard is directly over the center of the tube and the duct tape completely covers the chipboard. The duct tape must form an air tight seal for the tube to play correctly.



Step 6: Lay out your tubes on two 22-inch strips of duct tape. Notice how the closed ends line up evenly. Arrange the tubes so that the closed ends are an inch and a half above the duct tape.



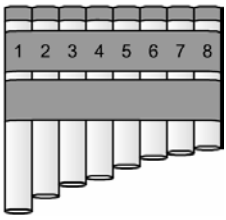
Step 7: Wrap the tape tightly around your tubes and seal.



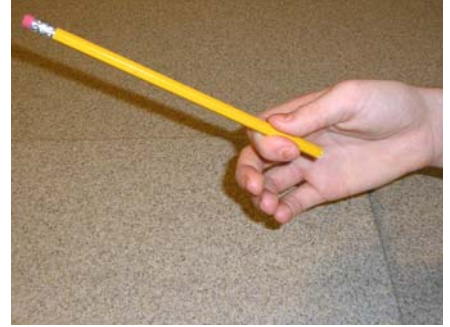
Step 8: Mark your tubes 1 through 8, with 1 being the longest and 8 being the shortest.



III. How to play your Fraction Tubes



Step 9: Lightly hold your pencil between your thumb and index finger and bounce the eraser on the closed end of the tubes.



Note: Do not hit the tubes with the metal or wooden part of the pencil.



Step 10: Try to strike the eraser in the center of the tube — playing this way will sound the best.



troubleshooting tips

If your instrument is not producing a clear sound with a definite pitch, try this:

- 1) Check that the chipboard squares are on the middle of each tube and the duct tape is firmly sealed (step 5). Also, make sure your duct tape is tightly pushed around the tops of the tubes.
- 2) Are you holding the pencil lightly? A tight rigid grip will not produce a nice sound. If your whole arm is moving when you play, your grip is too stiff. Loosen up — let your wrist and pencil move freely, like a drummer holding a drum stick (step 9).
- 3) Are you striking just the eraser on the tubes (step 10)? Also, check to see if your eraser is worn-down, or hard and brittle. If it is, try wrapping a rubber band around it. By striking your tubes with a softer object you will hear more of the musical pitch in your sound.