



IMPORTANT:

Read all directions before proceeding

Making Music With Palm Pipes

OVERVIEW: This presentation consists of a challenge in which students must work together to make musical sounds from palm pipes

OBJECTIVE: To encourage team building and develop a team player attitude. To enhance an understanding of how moving air and vibrations create sound.

GRADE LEVEL: K

STATE STANDARDS:

Physical Science—Some objects and materials can be made to vibrate to produce sound

TIME: 30 minutes

VOCABULARY: Pitch, frequency, volume, sound, energy, air, vibrations

MATERIALS: Per group of 2-4

LARGE ZIP-TOP BAG CONTAINING:

PIPE NOTE	PIPE LENGTH (CM)	PIPE LENGTH (INCHES)
F	23.6	9.5
G	21.0	8.5
A	18.75	7.5
B FLAT	17.5	7
C	15.8	6.25
D	14	5.5
E	12.5	4.75
OPTIONAL		
F	11.8	4.5
G	10.5	4.25
A	9.4	3.75
B FLAT	9.2	3.5
C	7.9	3
D	7.0	3.75
E	6.25	2.5
F	5.9	2.25

INTRODUCTION:

To introduce this lesson give out a pipe to each of your students and have them closely observe the pipe and write down as many observations as they can. After 1-2 minutes, share these observations as a class. Next, have students pair off, and have them observe and list how their two pipes are similar and different. Once again, share and discuss these observations as a class.

Show the students how to make the palm pipe vibrate by poking it into the palm of their hand. Have students listen and observe each other as they take turns vibrating their palm pipes. You may choose to ask the following questions to stimulate their thinking:

- * How are the vibrations of the two pipes similar and different?
- * What do you think it is that is causing the two pipes to vibrate differently?

Give them 2-3 minutes to write down their observations and make their hypothesis (inference). Then, discuss these observations as a group. In the discussion, it should be noted that it is the air within the pipes that vibrates to produce a sound but that the two pipes vibrate differently—with a different pitch (or frequency). Students will usually recognize that there is a relationship between the length of the pipe and the pitch of the sound produced.

Then ask your students to explain why they think that it is important and/or useful that different objects can vibrate at different pitches. Give the students 3-4 minutes to write down their ideas and then share them together as a class.

PROCEDURE:

Now explain that, as a class, you are going to demonstrate one of the reasons why it is important that objects can vibrate at different pitches. Direct them to the pattern of letters (notes) that you have written on the board and instruct them to vibrate their pipes when you point to their letter on the board. When you write the notes on the board, don't include the words and allow kids to recognize the song as they play it.

The notes for three simple songs are given below but you can play dozens of clever tunes with your palm pipes. Make sure to switch pipes with your students so they get to participate in a variety of ways.

Note: The palm pipes are a great (and free) way to celebrate student birthdays. Happy Birthday is easy to play and it provides a personal and fun way to care for kids on their birthday.

Twinkle, Twinkle, Little Star

Melody: F F C C D D C, Bb Bb AA G G F,
C C Bb Bb A A G, C C Bb Bb A A G (repeat top lines)

Happy Birthday

Melody: C C D C F E, C C D C G F, C C C A,
F E D, Bb Bb A F G F

America the Beautiful

Melody: F F G E F G, A A Bb A G F, G F E F
C C C C Bb A, Bb Bb Bb Bb AG,
A Bb A G F A Bb, C D Bb A G F

Ode to Joy

Melody: A A B C C B A G F F G A A G G
A A B C C B A G F F G A G F F

EXPLANATION:

Most of us know that vibrating objects produce waves. When our vocal chords vibrate, they produce waves that travel through the air. When these waves enter the ear of a listener, they can be interpreted as sounds. When these sounds are produced in meaningful patterns, we may interpret them as warnings, music, intelligible language, etc. While the interpretation of these sounds may now seem automatic to us, it takes a great deal of our brain's time and energy to figure out these wave patterns when we are young. For example, understanding the patterns of a spoken language is very complex and it becomes even more difficult if we try to master the patterns of a language different than our native tongue. Fortunately music, the art of giving structural forms and rhythmic patterns to sound, provides a design for vibrations that can be created and enjoyed by all cultures. Since Twinkle, Twinkle Little Star is usually the first science related song that most kids have learned; it is a fun place to start.

ESSENTIAL QUESTIONS:

- * What do you think is needed for the palm pipes to produce a sound?
- * What is the relationship between the length of the pipe and the pitch of the sound?
- * What are some other common objects that you could use to produce rhythmic patterns in a similar manner? (Wine glasses filled with water)