

Pilot country: Viet Nam

Topic of the lesson: Integrating Muong Traditional Music into a Physics Lesson on the source of sound

Subject: Physics

ICH Element: Muong traditional music

ESD Theme: Active, participatory learning

Grade: 7

1. Objectives

1.1. Knowledge

- Understand general characteristics of the sources of sound
- Identify some common sound sources
- Study the concepts of balance and oscillation
- Discover some popular traditional Muong musical instruments and their features
- Introduce the notions of high (treble) and low (bass) pitch

1.2. Skills

- Observe that the characteristic of the sound source is oscillation
- Explain the scientific nature of this physical phenomenon and recognize its application in daily activities

1.3. Attitude

- Encourage the students to be diligent and hardworking
- Evoke an interest in the cultural heritage of the Muong
- Develop awareness of the need to safeguard cultural heritage
- Become curious about physical phenomena

2. Preparation

2.1. Teacher

- Collect materials on Muong musical instruments from books and the Internet.
- Research and collect Muong musical instruments such as flutes and gongs from local artists.
- Record gong performances and the process of producing the *ô* flute by the Muong.
- Consult physicists to gather scientific explanation of the phenomenon.
- Plan activities for students and develop assessment tools.

2.2. Students

- Read section 11, lesson 10, of the Source of Sound book before the class

3. Teaching activity

3.1. Settling in

3.2. Presenting Chapter 2 of the Textbook

In this class, we will learn about acoustics. Acoustics is a science of sound. Understanding acoustics helps people to make interesting sounds and also prevent unwanted noise.

This chapter covers the following topics:

- What are the characteristics of the source of sound?
- What are the differences between low and high pitches?
- What are the differences between soft and loud pitches?
- Which contexts allow sound to be transmitted well?
- Under which conditions are sounds called noise? How can noise be minimized?

3.3. Lesson

We are living in a world of sounds. We can hear others' voices, songs and music, and we hear birds chirping, water splashing and horns, hammers and traffic. So how is sound created? What are the characteristics of sound? In this lesson, we will find answers to those questions.

Table II: Activity plan

Knowledge	Teacher's activities	Students' activities
<p>1. Recognizing diverse sources of sound Things that make sound are sources of sound.</p>	<p><u>Activity 1 (5 minutes): Recognizing sources of sound</u> Method: Observe and study the content. C1: Let's look at the screen Teacher presents a clip of different musical instruments (1st clip: Musical instruments)</p> <ul style="list-style-type: none"> ▪ <i>Indicate the sounds that you hear.</i> Gongs, horns, drums, two-chord fiddles, and flutes ▪ <i>Indicate some other sounds that you hear in your daily life.</i> Things that make sound such as car horns, drums, gongs, etc. are considered sources of sound. ▪ <i>So what is a source of sound?</i> Things that make sound are sources of sound. <p>So what are common characteristics of the sources of sound? We will learn about this in the second part.</p>	<p>Sound of gongs, horns, drums, etc.</p> <p>Teacher's voice, birdss, car horns, etc.</p> <p>Things that make sound are defined as sources of sound</p>
<p>2. What are the common characteristics of sound sources?</p>	<p><u>Activity 2 (25 minutes): Learning about the common characteristics of the sound source</u></p>	

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<p>2.1. Experiment a. Experiment with elastic band</p> <p>C3: When making sound, the elastic band vibrates.</p>	<p>a. Experiment 1 (6 minutes) Teacher presents steps to conduct the experiment. Teacher pulls the elastic band held by a student.</p> <p>Teacher presents the balance position (by using elastic band). Teacher arranges students to conduct the experiment.</p> <p>Students are asked to tell the others the result of their experiments.</p> <p>The Muong's traditional musical instruments include <i>ôi</i> flutes, ordinary flutes, horns, two chord-fiddles, gongs, and drums. Gongs and <i>ôi</i> flute are specific to the Muong culture.</p> <p>We've just conducted an experiment with the elastic band. It vibrates, thereby making a sound. So do the gongs vibrate when they make sound? We will find out in the next part of the experiment.</p>	<p>A student stretches the elastic band in front of the class.</p> <ul style="list-style-type: none"> ▪ Pairs of students conduct an experiment following three steps: <ol style="list-style-type: none"> 1. One student stretches the elastic band. 2. The other pulls the band. 3. Two of them observe, listen, and describe what they hear and see. ▪ The elastic band vibrates, making a sound.
<p>b. Experiment with gongs</p> <p>C4: When making sound, the gong surface vibrates.</p>	<p>b. Experiment with gongs (10 minutes) Method: Teamwork C4: Students bang on the gongs.</p> <p><i>Which things make sound? Does the gong surface vibrate? How can we recognize it?</i></p> <p>Teacher instructs: Use gong stick to knock on the gong, then touch it.</p> <p><i>What do you feel?</i></p> <ul style="list-style-type: none"> ▪ When you touch it, you can feel the vibration. To visualize it, you can use a wicker ball. ▪ Use the stick to knock the gong and gradually bring the wicker ball to touch the gong. <p><i>When the gong makes sound, does the ball vibrate? What happens when the ball vibrates?</i></p> <ul style="list-style-type: none"> ▪ So when making sounds, what are the characteristics of the gong? <p>We do not know exactly when the Muong gongs appeared. But we know that in the Đông Sơn bronze age (about 3,500 years ago), images of people playing gongs could be seen</p>	<p>The gong surface makes sound.</p> <p>Students knock and touch the gong. The gong surface vibrates.</p> <ol style="list-style-type: none"> 1. One student knocks on the gong surface. Another student brings the ball to touch the gong. 2. The whole team listens and observes. <p>The ball vibrates, meaning that when making sound, the gong surface vibrates.</p>

	<p>on the Ngọc Lũ bronze drum surfaces.</p> <p>In the epic <i>Creating Land and Country</i> of the Muong, the gongs are mentioned in many sections. It means that along with the bronze drums, the Muong gongs appeared about 3,000 years ago. Muong people created harmony in music according to the music assessment of that time. We are the Muong descendants and we can be proud of this.</p> <p><i>We have conducted experiments with gongs and found that the gong surface vibrates to make sound. How about the ôi flute? When it makes sound, which of its parts vibrate?</i></p>	
<p>c. Experiment with ôi flute</p> <p>C5: When producing sound, the air column inside the flute vibrates.</p>	<p>c. Experiment with ôi flute (7 minutes) Teacher invites one student to play the flute. <i>Which part produces a sound?</i></p> <p><i>Does the air column vibrate? How can we check it?</i></p> <ul style="list-style-type: none"> ▪ Teacher instructs students to put feathers in the flute hole and play. <p><i>What happen when the chicken feather vibrates?</i></p> <ul style="list-style-type: none"> ▪ Teacher asks students to unbind the adhesive tape at the hole on the flute that makes sound, and to blow into the flute again. <p><i>Can you compare with the first time you played the flute?</i> <i>Do you know why it's different this time?</i></p> <p>Teacher explains:</p> <ul style="list-style-type: none"> ▪ When you blow on the flute mouth, the tape vibrates, causing the air column to oscillate and making sound. ▪ When blowing in the flute mouth, the tape stops a part of the air column. This makes the air column and the tape vibrate and produces sound. ▪ When the tape is not stuck on the flute hole, the air column is not stopped. So, the vibration at the flute mouth is not created, and no sound is made. ▪ Traditionally, the Muong used banana leaf instead of tape to cover the flute hole. However, banana leaves need to be replaced often. Now, they use tape to cover the flute hole as you've just done in the experiment. <p>Teacher concludes:</p> <ul style="list-style-type: none"> ▪ Through the above experiments, when making sound, the elastic band, gong surface, and air column inside the flute oscillate. 	<p>A student plays the flute.</p> <p>The air column in the flute makes sound. Students discuss, to bring out ideas.</p> <p>Students follow the instructions and observe the chicken feathers. The air column inside the flute vibrates.</p> <p>Student plays flute without the adhesive tape covering one half of the hole that makes sound. The flute does not make a sound.</p>

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	<p><i>So what are the common features of things that make sound?</i></p> <ul style="list-style-type: none"> ▪ When making sound, things oscillate. <p>Teacher tells story of the <i>Ôi flute legend in Muong Bi</i>:</p> <ul style="list-style-type: none"> ▪ In the old days, there was a family with four children. The last-born was unable to speak. When their father died, the youngest child did not know how to grieve for his father. So, he pierced four holes on a bamboo pipe to symbolize the four children. He blew at the hole of the bamboo pipe to mourn for his father. Since then, the Muong have the <i>ôï</i> flute. ▪ The flute looks simple but not everyone can make it. To make it, the artists must have long experience and in-depth knowledge. We will learn about it through the following film clip. <p>Teacher presents the clip of making <i>ôï</i> flute (2nd clip: <i>Ôï</i> flute).</p>	<p>Students watch the film clip.</p>
<p>3. Application</p>	<ul style="list-style-type: none"> ▪ Teacher instructs students to do exercise C6 in their schoolbook. <p><i>Can you make paper and banana leaf produce sounds?</i></p> <ul style="list-style-type: none"> ▪ If student cannot, the teacher instructs them to wrap the paper and leaf to make a horn. <p><i>In addition to wrapping papers or banana leaves to make horns, do you know any other ways to make sounds with them?</i></p> <ul style="list-style-type: none"> ▪ Teacher lets students tear and vibrate the banana leaves. 	<p>Students conduct an experiment with papers and banana leaves.</p> <p>Students wrap banana leaves to make horns and play them.</p> <p>Tear and vibrate banana leaves.</p>
	<p><i>We already conducted an experiment with gongs. So do you know in which occasions gongs are used?</i></p> <ul style="list-style-type: none"> ▪ For the Muong, gongs not only make joyful and animated sounds but they are also a symbol of power and sacredness. They make the sky resonate to dispel evil spirits. Hence, gongs play a very important role in the Muong life. They are used in many different occasions. In the past, every Muong family had gongs in their house. Gongs were not only the traditional musical instruments but also precious objects that symbolized wealth and status. <p>Let's see the film clip (3rd clip: Gongs)</p>	<p><i>Sắc bùa</i> performance, farming initiation festival</p>

4. Review

4.1. In this lesson, we need to understand that:

- Things that make sounds are called sources of sound.
- Oscillation creates sounds.

4.3. Students try to play gongs.

- *You've just listened to different gong melodies. Now you can try to play some melodies such as pênh póng pênh, pênh póng khâm.*
- Teacher use this content to come to the point of the next lesson (**Height of Sound**) and instruct students to do their homework.
 - *Why do gongs have different sounds?*
 - *Big gongs make low sound and small ones make high sounds. Why?*

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