CAN YOU HEAR ME NOW?

By ***Mairlyn Kiser*** for Blue Ridge Public Television (WBRA, WMSY, WSBN)
Tazewell Middle School, Tazewell, VA

.

GRADE LEVELS: 5th – 8th grades

TIME ALLOTMENT: Four 45 minute blocks

OVERVIEW:
This lesson focuses on investigating sound waves and the properties of a wave. The students will create the two types of waves: the transverse wave and the longitudinal wave. After creating a longitudinal wave, the students will explain that sound waves are longitudinal waves caused by vibrating air particles that move through a medium. Students will explore the amplitude, wavelength, and frequency of a wave. They will locate the crest and trough of a wave. Students will use interactive Web sites to manipulate waves as they investigate the properties of a wave. Students will use home-made palm pipes to explore how the pitch of a sound can vary with the length of an object.

SUBJECT MATTER: Science

LEARNING OBJECTIVES:
Students will be able to:

- Define/differentiate between a longitudinal wave and transverse wave.
- Construct a longitudinal wave showing the wavelength, amplitude, crest and trough of the wave.
- Describe the concepts of wavelength, amplitude, crest, trough, and frequency.
- Describe how sound is produced through vibrations.
- Recognize that sound travels slower than light.
- Recognize that sound travels at different speeds through different substances.
- Explain that energy is needed to start a vibration and a great deal of energy is needed to create a loud noise and less energy creates a soft noise.
- Distinguish between the terms “loud” and “soft” and “high” and “low” in regard to sound.
- Explain how frequency determines a sound’s pitch.

STANDARDS:
State Standards:
The objectives listed may be used in part to address the Virginia Standards of Learning at http://www.pen.k12.va.us

5.2 The student will investigate and understand how sound is transmitted and is used as a means of communication. Key concepts include
a) frequency, waves, wavelength, vibration;
b) the ability of different media (solids, liquids, and gases) to transmit sound;

6.2 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include
c) heat, light, and sound

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include
a) wavelength, frequency, speed, and amplitude;…
b) the nature of mechanical waves; …

PH.9 The student will investigate and understand how to use models of transverse and longitudinal waves to interpret wave phenomena. Key concepts include
a) wave characteristics (periods, wavelength, frequency, amplitude, and phase)

MEDIA COMPONENTS:

Video:

Breaking the Silence: an Introduction to Sound, United Streaming- http://www.unitedstreaming.com

Web Site

http://westfieldnj.com/eis/team6/6science_ch17_3.htm

At this site students can find links to the Web sites that we will be using. Students can compare transverse and longitudinal waves with animated graphics. They can find waves where they can adjust the frequency and wavelength and view the effect of the change in each. They can investigate what causes waves and the properties of waves. They can investigate the relationship between sound and instruments based on the wave shapes.

MATERIALS :

Materials needed for Introductory Activity:

- 1 wire clothes hanger per group
- 2 thin strings –approximately 22-24 inches long – per group

Materials needed for Learning Activity:

- Computer(s)
- Television
- Pencil
- CD with United Streaming video (if downloaded onto CD)

Materials needed for Culminating Activity:

- PVC palm pipe per student (see directions for making palm pipes)
- 1 pair of goggles per student
- 1 slinky for each group
- 1 white rope (2 meters long)
- Data Table sheet
- Media Worksheet
- Music Notes on transparency for an overhead projector
- Overhead projector
- 2 meter sticks per group

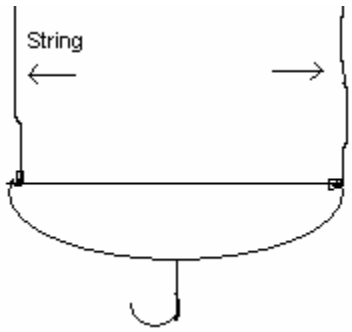
PREPARATION FOR TEACHERS:

- ✓ Prior to teaching the unit, bookmark the Web sites.
- ✓ Download the United Streaming videos to your desktop or download the United Streaming videos to a CD.
- ✓ Make sure you go through the instructions from the student materials handouts to make certain that you understand and are familiar with the lesson format and what the students need to do or understand for the lesson.
- ✓ When using media, always provide the students with a ***Focus for Media Interaction***, which is a specific task to complete during or after viewing video segments, Web sites, or other media material.
- ✓ Make the palm pipes according to direction for use. (These can be used many times. Clean after each use.)
- ✓ Put music notes for songs on a transparency. You can copy the songs in the back of the lesson or prepare your own.

INTRODUCTORY ACTIVITY: SETTING THE STAGE
1st Day

The Introductory Activity
Tell students that we are now going to investigate sound.

1. Have a student from each group get a wire clothes hanger and 2 pieces of string. Have the students tie a string on each end of the bottom of the clothes hanger. (They need to tie this as tightly as possible or they may want to use tape to hold it in place. The clothes hanger will be upside down. See picture below.)
2. When this is completed, have a student in each group hold the untied ends of the strings in each hand and hit the clothes hanger against a desk. Allow each person in the group to do the same.
3. Ask the students: "Did you hear the sound the hanger made when you did this? Would you consider this loud? Why?"
4. Now have a student in each group wrap the untied end of each string about 3 times around the pointer fingers close to the fingertip. Have the student put his fingertips, which have the wrapped strings around them, in each ear, lean over, and bang the clothes hanger on the side of the desk. (Make sure that the strings are touching inside the ear in order for the sound to travel along the strings into the ears.) Allow each student to do the same.
5. Ask the students: "Did you hear the sound the hanger made when you hit the desk this time? Would you consider this loud? Which was the loudest? Why do you think this sound was the loudest? Would there be a different sound if you should hit it against a soft material? Why?" (accept all reasonable answers)
6. Say, "We are now going to be learning about sound waves, how they are made, and why sounds are loud or soft and high or low."



LEARNING ACTIVITIES

Note to teacher: Have the United Streaming video downloaded to desktop or have it on CD ready for viewing before class starts.

1. **Focus for Media Interaction**: **Say**, "Have you ever wondered how sounds are made or why sounds are so different? Well, we are going to watch a video that will give us some of the answers to these questions. I want you to watch and tell me what the strings of the guitar are doing to create sound and what activity was done to demonstrate this." **Start (2:19)** video when you **see** a man sitting with a guitar and **hear, "**Hello**,** I'm Richard Southern**." Pause (3:32)** when you **see** the man again and **hear** "When the vibration stops, the sound stops." **Ask**: "What did the strings do to create sound?"(vibrate) "What activity did they do to demonstrate that strings vibrate to make sound?" (A box was made with rubber bands around it that were plucked.) "How can we make the sound stop?" (stop the vibration)

2. "**Focus for Media Interaction**: **Say**, "Now, I want you listen to what starts something vibrating. I, also, want you to be able to tell me why some sounds are soft and some are loud." **Resume** and **Pause (6:07)** when you **see** the boy with the ruler and **hear** "But a weak energy input will produce a sound that is soft, perhaps so soft we can't hear it." **Ask**: "What causes something to vibrate?" (energy) "What makes a sound loud?" (the greater the force or input of energy the louder the sound.) "What makes a sound soft?"(Less energy will cause a softer vibration.)

3. **Focus for Media Interaction**: **Say**, "In this next clip, I want you to focus on the definition of frequency. What does the word frequency mean? In what units is frequency measured? And what can't we humans hear?" **Resume** and **Pause (8:17)** when you **see** the man beside the harp and **hear** "…ranging from as high as 3,000 hertz to as low as 30 hertz. **Ask**: "What is frequency? (The number of times an object moves back and forth each second—that is, how often it vibrates—is called frequency.) "In what units is frequency measured?" (Hertz) "What can't we hear?" (sounds that vibrate less than 20 times a second and sounds that vibrate too quickly, or over 20,000 times a second.)

4. **Focus for Media Interaction**: **Say**, "Now, listen to the reason why sounds are not all alike. What determines if sounds are high or low? What is the highness and lowness of sounds called?" **Resume** and **Pause (9:27)** when you **see** the man again after you see the bicycle wheel and **hear** "The faster something vibrates, the greater its frequency." **Ask**: "Why are all sounds not alike?"(They have different frequencies.) "What determines if a sound is high or low or in between?" (The frequency of a sound) "What is the highness and lowness of sounds called?" (The pitch) "So we can say that the faster something vibrates, the greater its frequency and the higher its pitch."

5. **Focus for Media Interaction**: **Say,** "Remember that pitch and volume are not the same thing. In this next clip you should listen to find out the difference between pitch and volume. Also, listen to the difference in the sound that a thick rubber band makes compared to the sound of a thin rubber band." **Resume** and **Pause (12:34)** when you **see** a vibraphone and **hear** "When you hit these bars, the shorter ones vibrate faster than the longer ones." **Ask**: "What is volume of sound?" (It refers to how loud or soft a sound is.) "What is the pitch of a sound?" (Pitch refers to how high or low the sound is.) "What was the difference between the sound of the thick rubber band and the sound of the thin rubber band?" (The thick rubber band had a lower frequency and a lower pitch and the thin rubber band had a higher pitch.)

6. **Focus for Media Interaction**: **Say**, "From this next clip, I want you to be able to tell me how wind instruments work. I also want you to be able to tell me how your windpipe works." **Resume** and **Pause (15:46)** when you **see** an alarm clock and **hear "…**how a sound's pitch depends on the frequency of the

sound, that is, on how fast something vibrates…" **Ask**: "How does a wind instrument work?" (When you blow into the instrument you cause a column of air to vibrate.) "How does you windpipe work?" (The vocal cords vibrate as you force air through your windpipe.) "How do you control the pitch of you voice?" (By increasing the tension of the vocal cords)

7. **Focus for Media Interaction**: **Say**, "How do vibrations reach our ears? What is air made up of? What happens to the air around the object that is vibrating?" **Resume** and **Pause (17:50)** when you **see** a model of air molecules and **hear** "In this way, the sound wave is passed along." **Ask**: "What are sound waves? (They are caused by vibrations that travel through the air.) "But isn't air empty?" (No) "What is air made up of?" (It is made up of tiny bits of matter called molecules.) "What happens to the air around the object that is vibrating?" (The object pushed these molecules of air together. These molecules bump against the molecules next to them.) "What happens to the first molecules?" (They return to their original position.) "So, what makes sound waves?" (The pushing movement of molecules back and forth that makes sound waves.)

8. **Focus for Media Interaction**: **Say,** "I want you to tell me why you see lightning before you hear the thunder during a thunderstorm. Can sound travel through anything other than air? If so, does sound travel differently through these materials? How?" **Fast forward to (19:06)** and you will **see** the man talking and **hear** "Which travels faster, lightning or thunder?" **Play** and **stop (21:13)** when you **see** man talking and **hear …"**that is why sounds are much louder under water than in air." **Ask: "**Why do you see lightning before you hear thunder?" (Light travels faster than sound.) "Do you remember how fast light travels?" (It can travel around the Earth over 7 times in a second-about 186,000 miles per second.) "How fast did they say that sound can travel?" (about the length of 4 football fields in a second) "Can sound travel through any other material?" (Yes) "Through what does sound travel the fastest?" (solids) "Which does sound travel through the fastest, air or water?" (water)

9. **Focus for Media Interaction: Say, "**What about the place where there is no air, say, outer space? Can sound travel there? Listen to this last clip for the answers to this question." **Resume** and **Pause (21:31)** when you **see** an astronaut jumping on the moon and **hear** "…silently because there was no air to conduct their sound." **Ask**: "Can sound travel in space?" (No) "Why" (There is no air there.) "Why does sound need air to move through?" (Sound must have a medium, or material, in which to move through.) "Tomorrow we will learn more about sound and how it travels."

2nd Day

Before beginning the second day, refer back to what students have learned the previous day, emphasizing the vocabulary: frequency, pitch, volume, and vibration.

Review the video. Ask:

1. What caused all sounds? (Vibrations)

2. Name some examples of things vibrating that cause a sound. (Some examples might be the rubber bands, a guitar or other musical instrument, vocal cords, thunder, etc.)

3. What is necessary to cause something to vibrate? (Energy)

4. What determines whether a sound is loud or soft? (The amount of energy used to create the sound determines loudness and softness.)

5. What does frequency mean? (It is the number of times that something vibrates per second.)

6. What units is frequency measured in? (Hertz)

7. What determines whether a sound is high or low? (The sound's frequency)

8. What is the highness or lowness of a sound called? (Pitch)

9. How does sound travel through air? (As sound waves. Sound waves are caused by vibrations disturbing the air molecules around the vibrating object.)

10. Which travels faster sound or light? (light)

11. Can sound travel through other materials besides air? (Yes)

12. Which can sound travel through best, solids, liquids, or gases? (solids)

Bookmark the Web site:
http://westfieldnj.com/eis/team6/6science_ch17_3.htm

Focus for Media Interaction: Tell the students: "You are now going to go to the computers where you will work on a Web site that will link you to the Web sites that are dealing with sound waves. You are to follow the directions on the Media Worksheet and answer all questions. The vocabulary words that you will be concentrating on today are transverse waves, longitudinal waves, crest, trough, frequency, hertz, and wavelength. I will walk around and make sure that you have no problems. If you do, hold up your hand and I will help you. You will turn in this Media Worksheet at the end of the class period."

Remind students that they are not to wander away from the Web site!

CULMINATING ACTIVITY
(3rd Day)

This activity will provide a constructive example of a longitudinal and a transverse wave where the student can see the shape of a wave and can locate the amplitude, wavelength, trough and crest of a wave. During the second part of this activity the students will show how sound is produced by vibrations and that the shorter the wave, the higher the pitch.

1. Ask students what a transverse wave looks like. (It is an S –shape and looks like a snake.) Tell the students that they are going to make transverse waves with a rope.
2. Give each group of students a rope. Have two students hold each end of the rope. Now have one hold the rope still and the other will move the rope up and down to demonstrate a transverse wave. Remind students that sound does not travel by a transverse wave, but by a longitudinal wave.
3. Now, have the students do this on the floor by one moving the rope from side to side as the other student holds the rope stationary. When they have gotten a good transverse wave, lay the ends down and locate the crest and trough of the wave. Have the students find the wavelength of the wave and the amplitude. Let the students use a meter stick and measure the wavelength and the amplitude of this wave.

4. One student will hold one meter stick at the rest position on the wave and another student will measure the amplitude. After measuring amplitude, measure the wavelength of a wave and find the frequency of the waves. Have the students record this on their Data Table. On the space provided below on the Data Table, draw and label the transverse wave that you made with the rope.
5. Using a slinky the students will demonstrate a longitudinal wave. (This is the type of waves for sound waves.) Have the students locate and measure the wavelength, locate the compressions and the rarefactions (The students can drop their pencil beside the compression and the next compression to measure the wave length. They can do the wave again and catch the compression and measure compression as closely as possible. Do the same for the rarefaction.) and other properties of a wave. Now have the students draw and diagram the longitudinal wave. (If the compressions of a longitudinal wave are very crowded, the wave has a large amplitude.) This can be used for assessment.

Day 4

1. Now, tell the students that they are going to use palm pipes to demonstrate pitch. (See instructions for making palm pipes.) **Say,** "I am going to give each of you a palm pipe. It is a palm pipe, not a mouth pipe. Do not put it in your mouth. Notice on the side of your palm pipe is a letter or note. We will be making music with our palm pipes. What you will do is grasp the pipe firmly in one hand and quickly bring it down onto the palm of the other hand, allowing the end of the pipe to strike the palm of the second hand. Let's try that together." Allow the students some practice time. Have the students practice playing the same note in unison. Then try a scale involving all the students. Practice playing a "chord" (two notes in unison).
2. Tell the students that they are now going to play a song. Have a student volunteer to be the *conductor*. (The conductor points out or spots which note to play. As the conductor spots the note, students play their note. No matter what the length of the pipe for that note is, you will play that corresponding pipe. An example is: if your pipe is a short A or a long A, when the A note is played, all A- note pipes will be played. You can play the song using the melody and harmony together, or play melody only. Melody and harmony are played by palming two different notes at the same time.
3. Have the conductor spot the notes in time to the song. Play your songs. (See some songs at end of lesson or you can make your own.) Enjoy your orchestra.
4. **Ask**: "What is happening?" (The sound is made by the air vibrating in the palm pipe.) "What causes the vibration?" (Moving air causes the vibrations.) "What creates the different sounds or pitch?" (The length of the pipes created different pitch.) "What was the difference between the short pipes and the long pipes?" (They had different pitch.) "Explain." (The shorter pipe will produce a higher pitch and the longer pipe will produce a lower pitch.) "Which has the highest frequency?" (The pipe that is shorter.) "Which has the lowest frequency?" (The pipe that is longer.)
5. You may want to finish up the lesson by asking other questions, or reviewing the questions already asked. You may want to ask some questions to lead the students into exploring light waves.

CROSS-CURRICULAR EXTENSIONS

Science:

1. Students can use the knowledge gained from this lesson to explore light waves and the electromagnetic spectrum.
2. The students can investigate how energy is changed from one form to another, in that sound waves are mechanical energy.
3. Students can record and investigate sounds made by animals to find patterns or distinguish pitch of each animal. Animals make different sounds with their vocal cords, while others make sounds with various other body parts. An example of this might be the way a cricket makes sounds. Students can investigate these animal sounds.

4. Students can investigate the intensity of sound, the Decibel Scale, the Doppler Effect, reflection, refraction, and diffraction. They can, also, investigate wave interference and boundary behavior.
5. Have the students listen to each pipe and arrange the pipes in order from high to low.
6. Ask the students to experiment to find other ways to make sounds with the pipes (hitting, dropping, blowing, etc.) Remember to wash off pipes after use.

Language Arts :
1. Students can choose a person that contributed to the world of sound. They can write a one-page report on this person's contribution. Encourage students to use the library for books and articles. Such people that students might research and write about are Thomas Edison, Alexander Graham Bell, Louie Armstrong, Ernst Mach, etc.
2. Students can research echolocation and write an expository paragraph about the use of echolocation by animals such as the whales.

Social Studies
1. Students can investigate the different kinds of instruments that different cultures have today. The students can find out if these instruments are used for music or other purposes.
2. Have students differentiate the difference of the speed of sound waves in cold climates to hot climates. They can explain what causes the difference in the speed of sound.

Music:
1. Have the students match the pitch of the pipe to other instruments (keyboard, xylophone, piano, etc.) to identify the note.
2. Have the students place the pipes tightly on their palm and blow across the top of the pipe. How does the sound differ from palming the pipes. (Remember to wash the pipes after use.)
3. Build different instruments (string, wind, percussion) and have a symphony of silly sound.

COMMUNITY CONNECTIONS

1. Take the students to a band concert, a musical, or a music recital.

2. Have a turkey hunter come to class to demonstrate different turkey calls.

3. An ultrasound is a type of sound that is useful in medicine. A doctor or nurse can visit the class and talk about ultrasound waves and ultrasound equipment.

4. Have a zookeeper visit the classroom and talk with the students on the different sounds that zoo animals make and why they might use these sounds.

Name_____

Data Table Sheet

Longitudinal Wave

	Wavelength	Amplitude	Frequency
Trial 1			
Trial 2			
Trial 3			

Draw and diagram a longitudinal wave:

Transverse Wave

	Wavelength	Amplitude	Frequency
Trial 1			
Trail 2			
Trial 3			

Draw and diagram a transverse wave:

MEDIA WORKSHEET

http://westfieldnj.com/eis/team6/6science_ch17_3.htm

Please, follow directions:

1. Arrow down and click on "What are Waves?"

Answer the following questions:

1. What are waves?_____
2. Waves have to move through what?_____
3. Click on "Play" on the picture.
4. The wave transfers what? _____
5. What can the medium be? _____
6. What waves do not need to pass through matter? _____
7. Give examples of these waves. _____
   _____
8. What vibrates with these kinds of waves? _____
9. Space is almost a perfect what? _____
10. Click "next" at the bottom.
11. What are the two main types of waves? _____
12. Explain the movement of the transverse waves. _____
    _____
13. Give examples of this kind of wave. _____
    _____
14. Click "Play" and watch the example of the wave.
15. Draw the wave:

16. Explain the movement of the longitudinal wave._____
    _____
17. Give examples of this kind of wave. _____
    _____
18. Click "Play and watch the wave.
19. Draw the wave:

Click back to the main page.
Click on "Longitudinal and transverse waves- animation demonstration with text."

20. Watch the two main types of waves.
21. Pick a single particle and watch its motion on the first wave. What does the particle do? _____
22. Go to the next wave and pick a single particle with the transverse wave. What does this particle do? _____

Click back to the main page.
Click on "Waves- interactive-can adjust frequency, wavelength and watch the effect of change."

23. Water waves and sound waves are example of what?_____
24. A wave is what? _____
25. What is amplitude? _____
26. The wavelength is what? _____
27. What is the crest of a wave? _____
28. Adjust the slide in the demonstration to the left and then to the right. Notice how changing their value affects the shape of the wave.

Click back to the main page.
Click on "Waves and Wavelike Motion."
Click on The Anatomy of a Wave in the left margin.

29. What 2 letters identify the crests?
30. What 2 letters identify the troughs?
31. There are 5 wavelengths that are identified on page 1 and 2. What are these corresponding points?
32. What letters identify the compressions on the longitudinal wave?
33. What letters identify the rarefactions on this wave?
34. What 2 sets of points identify the wavelengths of the longitudinal wave?

Click back to the main page and click on "Quia" and play a game of concentration with the characteristics of waves.

Turn in for evaluation when completed.

Answer Sheet for Media Worksheet

1. vibrations
2. a medium
3. ***
4. energy
5. matter, such as solids, liquids, and gases
6. electromagnetic waves
7. radio, microwaves, infra red, light, ultraviolet, x-ray, gamma ray
8. electrical or magnetic field
9. a vacuum
10. ***
11. longitudinal and transverse waves
12. The vibrations are at right angles to the direction of the wave.
13. electromagnetic waves, waves on the surface of water
14. ***
15. (Drawing should look like a transverse wave.)
16. The vibrations are along the same direction as the wave.
17. sound waves, waves in a stretched spring.
18. ***
19. (Drawing should look like a longitudinal wave.)
20. ***
21. The particle oscillates or moves back and forth and does not move down the tube with the wave.
22. This particle oscillates up and down and does not move along with the wave.
23. mechanical waves
24. a disturbance which moves through a medium
25. the height of a wave
26. the distance from the top of one wave to the top of the next wave
27. the top of a wave
28. ***
29. A,F
30. D.I
31. A to F, B to G, E to J, D to I, and C to H
32. A, C, E
33. B, D, F
34. A to C and B to D

How to Make Palm Pipes.

Required tools: meterstick, permanent marker, sand paper, and PVC cutter. (Caution: PVC cutters are very sharp. If you do not feel comfortable using this tool, ask your school's technology or shop teacher for assistance. Always use extreme caution when using tools. Wear appropriate eye protection.)

1. Mark off the PVC pipe to the lengths shown for each note. Use the PVC pipe cutter and cut the pipe to the marked length.
2. After cutting, sand off any sharp edges, and mark the pipes with the musical note associated with that length. An alternative may be to mark the notes with different colors of tape.
3. Clean pipes after each use with a solution of alcohol or a mild solution of Clorox and water.

Note	Length (inches)	Length (cm)	Frequency (Hz)
F	9.8	24.8	349.2
G	8.7	22.1	392.0
A	7.8	19.7	440.0
B flat	7.3	18.6	466.2
C	6.5	16.6	523.3
D	5.8	14.8	587.3
E	5.2	13.2	659.3
F	4.9	12.4	698.5
G	4.4	11.1	784.0
A	3.9	9.9	880.0
B flat	3.7	9.3	932.4
C	3.3	8.3	1046.5
D	2.9	7.4	1174.7
E	2.6	6.6	1318.5
F	2.4	6.2	1396.9

Songs:
Mary Had A Little Lamb

Melody E D C D E E E D D D E E E
Mary had a little lamb, little lamb, little lamb,
E D C D E E E E D D E D C
Mary had a little lamb its fleece was white as snow.

London Bridge

Melody D E D C G C D, F G C, G C D,
London Bridge is falling down, falling down, falling down,
D E D C G C D, F D G E
London Bridge is falling down, my fair lady.

This Old Man

Melody G E G G E G A G F E D E F E F
This old man, he played one, He played knick knack on my thumb with a
G C C C C C D E F G G D D F E D C
Knick knack paddy wack give the dog a bone, This old man came rolling home.

Old MacDonald Had A Farm

Melody C C C E F F E E E D D C
Old MacDonald had a farm, e-i-e-i-o
E C C C E F F E E E D D C
And on that farm he had a cow, e-i-e-i-o
C C C C C C C C C C C C
Moo moo here, moo moo there, ev'-ry where a moo moo,
C C C E F F E E E D D C
Old MacDonald had a farm, e-i-e-i-o

Twinkle, Twinkle Little Star – play the melody and harmony lines in unison (Bottom and top notes go together.)

Melody F F C C D D C Bb Bb A A G G F

Harmony C C A A Bb Bb A G G F F E E C
Twinkle-twinkle little star how I wonder what you are,

Melody C C Bb Bb A A G (repeat this line)

Harmony A A G G F F C
Up a -bove the world so high
like a diamond in the sky

Repeat first line