

Lesson Title: We've Got Rhythm**Grade level: 5-8****Topic/Subject Matter: Music****Time Allotment: Two to three 45-minute class periods**

Overview: THE MUSIC INSTINCT showcases the research and discovery process of scientists whose work focuses on the interrelationship between music and science. Music is a topic that is very accessible and familiar to young people, and can be used as a topic for simple experiments that students design. In this lesson, students will explore the ways in which humans create and respond to rhythm, using examples from THE MUSIC INSTINCT as a guide.

The lesson begins with a fun game that challenges students to maintain a steady rhythm. Students will then brainstorm ways in which rhythm is present in their body and the world around them. In the Learning Activities, students will view segments from the MUSIC INSTINCT program and examine ways that hospitals are using music and rhythm to help patients. Students will learn about synchronizing to music (moving in time to a beat) and reflect upon whether this is a uniquely human skill. Students will then view a clip of a cockatoo synchronizing to music. Students will then learn about syncopation and view a video segment illustrating a syncopated beat. Students will then explore an interactive where they try to identify syncopated and non-syncopated rhythms. The lesson ends with students experimenting with rhythm and creating their own syncopated and non-syncopated rhythms using their hands, feet, simple rhythm instruments and/or an online interactive featuring animal sounds.

Media Resources**Video**

The Music Instinct, selected segments

1. "Healing Rhythms." A brief look at how music helps patients in hospitals.
2. "Synchronization." An introduction to synchronization with neurobiologist Aniruddh Patel and a look at a bird moving to music.
3. "Syncopation." An introduction to syncopation with musician Bobby McFerrin and scientist Daniel Levitin.

Clip #	Title for Clip	Timecode at START of clip	Timecode at STOP of clip	Visual and audio cue for START of clip	Visual and audio cue for STOP of clip	One-sentence summary of clip
1	Healing Rhythms	13:45	14:04	Start with, “In hospitals, music’s connection to the body is used to steady the breathing of premature babies and the heart rates of cardiac patients.”	End a few seconds after, “Music often echoes the rhythm of the human heart beat.” (Stop right before “...and our physical connection.”)	A brief look at how music helps patients in hospitals.
		1:21:42	1:22:43	Start with, “Brain imaging shows a strong connection between the auditory and motor regions of the brain...”	End after, “if their actions are accompanied by music.”	
2	Synchronization	1:38:40	1:40:46	Start with, “Humans can move in time—synchronize-- to a beat.”	End after, “If a bird can do something that we think of as genuinely musical, like moving to the beat of music, to me that suggests that that doesn’t require natural selection for music.”	An introduction to synchronization and a look at a bird moving to music.
3	Syncopation	59:20	1:01:23	Start with beginning of McFerrin’s piano playing (Daniel Levitin shown on screen) before, “One structural device is when something really major happens...”	End after, “...and it’s the frontal lobe that’s trying to predict what’s going to happen next, whether you’re aware of it or not.”	An introduction to syncopation.

Web sites:

SFS Kids Fun with Music: Music Lab

<http://www.sfskids.org/templates/musiclab.asp?pageid=4>

In the “rhythm” section of the Music Lab, students can listen to 8 different rhythms with the “Go Experiment with Rhythm” activity. In this lesson, students will listen to different rhythms to identify a syncopated beat.

Rhythm Sequencer

<http://www.pbs.org/wnet/musicinstinct/educators/lesson-plans-overview/15/>

This interactive feature of *The Music Instinct* Web site enables students to create their own rhythms using sounds from nature.

Standards:

National Standards for Arts Education: Music

<http://artsedge.kennedy-center.org/teach/standards.cfm?subjectId=MUS&gradeBandId=&sortColumn=&x=8&y=3>

Content Standard 4: Composing and arranging music within specified guidelines

Grades 5-8 Achievement Standard

- Students compose short pieces within specified guidelines (e.g., a particular style, form, instrumentation, compositional technique), demonstrating how the elements of music are used to achieve unity and variety, tension and release, and balance
- Students use a variety of traditional and nontraditional sound sources and electronic media when composing and arranging

Content Standard 6: Listening to, analyzing, and describing music

Grades 5-8 Achievement Standard

- Students demonstrate knowledge of the basic principles of meter, rhythm, tonality, intervals, chords, and harmonic progressions in their analyses of music

National Science Standards:

National Science Education Standards, Grades 5-8

http://www.nap.edu/openbook.php?record_id=4962

LIFE SCIENCE: Content Standard C

As a result of their activities in grades 5-8, all students should develop understanding of

- **Regulation and Behavior**
 - Behavior is one kind of response an organism can make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels, including cells, organ systems, and whole organisms. Behavioral response is a set of actions determined in part by heredity and in part from experience.

Materials:

For each group of 2-3 students:

- 1 computer or rhythm instruments (such as drums) to create a variety of rhythms

For the class:

- Items for the “This is a What?” introductory activity. Collect one object per student. Objects should be relatively small and easy to say quickly. Here are some examples: pen, book, pencil, card, book, watch, cup, fork, spoon, plate, cap, phone, etc. If you do not have enough items, ask each student to bring an object to use in the game or use more than one example of the same object (for example, more than one pen).

Objectives:

Students will be able to:

- Define “rhythm” and provide examples of how rhythm is present in our lives.

- Describe ways that humans respond to rhythm and cite examples of how rhythm can help patients.
- Define “synchronization” and discuss whether this is a uniquely human ability.
- Define “syncopation.”
- Identify and provide examples of syncopated and non-syncopated rhythms.
- Create their own rhythms, using hands, feet and/or online tools.

Prep for Teachers:

Prior to teaching this lesson, you will need to:

Preview all of the video segments and Web sites used in the lesson.

Download the video clips used in the lesson to your classroom computer, or prepare to watch them using your classroom’s Internet connection.

Bookmark the Web sites used in the lesson on each computer in your classroom. Using a social bookmarking tool such as del.icio.us or diigo (or an online bookmarking utility such as portaportal) will allow you to organize all the links in a central location.

Collect objects for the “This is a What?” introductory activity (See materials section above.) Collect one object per student. If you are not familiar with the game, you can view some examples on the web of people playing the game. Here are some examples:

- <http://vids.myspace.com/index.cfm?fuseaction=vids.individual&VideoID=14560804>
- <http://www.youtube.com/watch?v=MHMPq6cVODo&NR=1>
- <http://www.youtube.com/watch?v=88fLknTKHuY&feature=related>

Introductory Activity:

1. Gather the objects for this activity (one for each student). Put the objects in a pile in front of you, so that you can access them easily. Ask your students to sit in a circle with you.
Tip: If you have a large group of students, ask your students to form multiple circles of 8-12 students per group.

2. Demonstrate how to play the game, by picking up one of the objects (for example, a pen). Show the object to the person immediately to your right (person 2), while saying: “This is a pen.” The person to your right should respond: “A what?”
The dialogue then continues as follows, with you as person 1:

Person 1: A pen
Person 2: A what?
Person 1: A pen
Person 2: Oh, a pen

Person 2 then takes the pen and then gives it to the person immediately to his or her right in the same manner as described above:

Person 2: “This is a pen”
Person 3: A what?”

Person 2: A pen

Person 3: A what?

Person 2: A pen

Person 3: Oh, a pen

Person 3 then takes the pen and gives it to the person to the right.

3. Ask students to continue passing the pen around the circle until it gets back to you. Then explain that now you are going to make it a little harder and start passing around more things.
4. Pass the pen to the person to your right, as described above. Then, right after person 2 says, “Oh a pen” and grabs the pen, start passing object # 2, as follows:

Person 1: This is a book
Person 2: A what?” (Person 2 looks at you when saying “a what?”)
Person 1: A book (Person 2 looks away from you and says “a pen” to person 3, as you say “a book.”)
Person 2: A what?
Person 1: A book
Person 2: Oh, a book

At this point, person 2 takes the book and then begins passing it, in the same manner to person 3.
5. Continue the game, by initiating a new object each time you pass the previous object. Stop adding a new object once everyone has an object in their hands. Continue playing the game, by continuing to have everyone pass the objects around the circle in the manner described above.
6. In order to emphasize the rhythm involved in this activity, once students have become comfortable with the game, ask them to continue passing the objects, while saying “la, la, la, la” instead of words (using the same rhythm as before). For example,

La la la la
La la?
La la
La la?
La la
La, la la!
7. Next, have your students put down the objects and continue the same rhythm, by saying “la, la, la...” and clapping to the beat.
8. After clapping to the beat for a few minutes, ask students to stop and comment on their thoughts about the game. Ask students what made the game challenging? (*They had to say the words and pass the objects, while sticking to the rhythm.*) Discuss what this activity has in common with music. (*There is a specific rhythm.*)
9. Ask students to brainstorm other games that also rely on rhythm. (*Concentration, are you ready?; patty cake; jump rope; dance, dance revolution, etc.*)

10. Ask students to define rhythm. (*A repeating pattern organized in time; the organization of sound in time.*) Divide students into groups and ask each group to think about rhythms in one of the following categories:
 - rhythms in nature
 - rhythms in the body
 - rhythms in machines
11. Lead a discussion about the different types of rhythms:
 - rhythms in nature (*waves in the ocean; raindrops falling*)
 - rhythms in the body (*heart beat, breathing, walking, etc.*)
 - rhythms in machines (*rhythm of trains, cars, etc.; jackhammers; washing machines; clocks; swings; pendulums; see saws, etc.*)
12. Explain that this lesson is all about rhythm. Let your students know that during the lesson they are going to explore how humans create and respond to rhythm and will also create their own rhythms.

Learning Activity 1:

1. Ask your students when they think humans are usually first exposed to rhythm. Explain that humans are exposed to rhythm even before birth. The fetus begins to hear between 17 and 19 weeks. They are already in a world of sound, of breath and heartbeat, of rhythm and vibration.
2. FRAME the first video segment by explaining that the students are going to watch a video clip that discusses ways that our breathing, pulse and movements can be helped by music. Provide a FOCUS by asking students to find out ways that the rhythm of music can be used in hospitals to help patients.
3. PLAY Video Segment 1, “Healing Rhythms.” FOLLOW UP by asking students to discuss ways that the rhythm of music can be used to help patients. (*Music is used to steady the breathing of premature babies. In hospitals, music is used to steady the heartbeats of cardiac patients. The walking of Parkinson patients can be improved if their actions are accompanied by music.*)
4. Ask students why they think that music can help Parkinson’s patients improve their walking? (*There appears to be a strong connection between the auditory and motor regions of the brain, which can help explain why music can help to improve motor skills of Parkinson’s patients. Music seems to engage the motor system.*)
5. Remind students that the previous clip mentioned that everyone, including children and people not trained in music, will begin to rhythmically move or dance when hearing music. Ask if anyone knows the term that means “moving in time to a beat.” (*Synchronization.*)
6. FRAME the next segment by explaining that you are now going to show a video clip that looks at synchronization and whether or not the ability to synchronize to music is unique to

humans. Provide a FOCUS by asking students to make predictions about whether or not they think other species can move in time to a beat.

7. PLAY Video Segment 2, “Synchronization.” FOLLOW UP by discussing the segment. Ask your students what they think now about whether other species can synchronize to music. (*At least one bird- Snowball- can.*) Lead a discussion about the segment. During the discussion, explain that the ability to synchronize to a beat is not commonly observed in non-human species.
8. *Optional:* Tell your students that it is now time to celebrate the ability to synchronize. Play a song and ask your students to move to the beat.

Learning Activity 2:

1. FRAME the next clip by explaining that your students are now going to learn more about rhythm and variations in rhythm. Explain that the next segment features musician Bobby McFerrin and scientist Daniel Levitin exploring the concept of “syncopation.” Provide a FOCUS, by asking students to come up with a definition of “syncopation” based on the clip.
2. PLAY Video Segment 3, “Syncopation.” FOLLOW UP by asking students to provide a definition of syncopation. (*A sound or an emphasis in music, which is in some way unexpected. In a syncopated rhythm, an accent is placed somewhere that is not normally emphasized. For example, in Latin Music—sambas, mambos. Normally in 4/4 time, the emphasis is expected on the 1st and 3rd beats in a measure. In a syncopated rhythm, the emphasis can be placed somewhere else in the measure.)*
3. Go to the [SFS Kids Fun with Music: Music Lab](#) and click on “rhythm” in the blue Music Lab menu box and then select “Go Experiment with Rhythm.” Tell your students that you are going to play some different rhythms and you want them to point out when they hear a syncopated beat.
4. Drop House #1 on the blank spaces below and then press play. Ask your students whether or not that is a syncopated beat. (*No.*) Why not? (*It is a very predictable steady beat.*) Click on “More” and then repeat the process for House #8. Discuss whether it is a syncopated beat and why/why not. (*It is not, because it is a very predictable and steady beat.*)
5. Repeat the process for house #6. Ask whether or not this is a syncopated beat. (*Yes.*) Discuss why it is syncopated. (*Accents are in places that are not normally emphasized.*)

Culminating Activity

1. Log onto the [Rhythm Sequencer](#). Explain that in a few minutes everyone will have a chance to make their own rhythms by clapping, tapping and/or using animal sounds. Demonstrate the different sound options, by clicking on the names of each of the sounds on the Sequencer.

2. Then demonstrate how to make a non-syncopated rhythm by selecting an animal and then clicking on the 1st and 3rd beats of each measure for that animal. Then press “PLAY” to reveal the syncopated rhythm.
3. Click on several animals for the 1st and 3rd beats of each measure to demonstrate how to layer sound.
4. Ask your students for suggestions on what you could do to create a syncopated rhythm. (*In one or two measures, move the emphasis to the 2nd or 4th beat to create an unexpected change from the existing pattern.*) Work together with your students to create a simple syncopated beat.
5. Divide your students into small groups of 2-3 students and instruct each to create their own rhythms. If possible, ask the students to log onto the Rhythm Sequencer to create their own rhythms. If students do not have access to computers, encourage them to create rhythms using clapping, tapping, snapping and/or simple rhythm instruments. Remind students that their rhythms need to have a repeating pattern.
6. Encourage students to experiment with a variety of sounds and rhythms. Ask each group to create two rhythms to which they can dance. One should be a syncopated rhythm and one a very steady, predictable beat.
7. After students have created their rhythms, ask for volunteers to share their works with the rest of the class.