EPISODE THEME
The Hammond B3 Legacy

SUBJECT
Wil Blades

GRADE RANGES
K-12 and Post-Secondary

CURRICULUM CONNECTIONS
Music

OBJECTIVE
To introduce students and educators to the creative talents of Wil Blades and the Hammond B3 Organ; to inspire students to consider the possibilities of expression through the organ; to provide an historical context for the Hammond B3 organ.

STORY SYNOPSIS
26-year-old Wil Blades is a young connoisseur of the Hammond B3 Organ. In this episode, Spark follows Wil as he carries his 400+ pound instrument to gigs, and observes his dedication to learning one of the hardest instruments to master, carrying on a tradition over 50 years old.

INSTRUCTIONAL STRATEGIES
- Individual and group research
- Individual and group exercises
- Written research materials
- Group oral discussion, review and analysis

INSTRUCTIONAL OBJECTIVES
To inspire students to consider the creative capacities of the Hammond B3 organ.
To introduce students to the work of Wil Blades
To reveal how new forms of musical expression can be found in old or “traditional” instruments

EQUIPMENT NEEDED
TV & VCR with SPARK story “The Hammond B3 Legacy”, about composer and musician Wil Blades
Computer with Internet access, navigation software, speakers and a sound card, printer
Cassette player, CD player, or computer audio program

MATERIALS NEEDED
Access to libraries with up-to-date collections of periodicals, books, research papers and videos
Different examples of Hammond B3 music (see Resource section)
Access to the SPARK DVD on Music, from the 1st and 2nd seasons.

INTELLIGENCES ADDRESSED
Logical-Mathematical – the ability to detect patterns, reason deductively and think logically.
Musical – the ability to read, understand, and compose musical pitches, tones, and rhythms.
Interpersonal – the ability to understand the feelings and motivations of others.
Intrapersonal – the ability to understand one’s own feelings and motivations.

See more information on Multiple Intelligences at www.kqed.org/spark/education.
CONTENT OVERVIEW

Wil Blades is at the top of the local music scene as a Hammond B3 organ player. The B3 is that big warm sultry, funky tone that provided the groove to many of the 1960's and 70's R & B recordings. The B3 is experiencing a revival today, particularly among jazz saxophonists who find it a nice compliment in a trio setting.

Blades is only in his twenties but plays like a veteran, and his knowledge of the instrument is encyclopedic. He has accompanied the greats, including his good friend and B3 legend, Dr. Lonnie Smith. Their relationship is based in part on their love of music, but also, because mentoring among the older generation of organist is common. In addition, there aren’t a lot of places to learn how to play the B3.

There aren’t a lot of places besides The Boom Boom Room that have a B3 available, so Blades owns three of his own organs. For many of his performances, Blades lugs his organ around the Bay Area in his van -- as Spark witnesses. As he says, "It’s like a piece of furniture." Imagine moving a 400-pound desk around, and you begin to get the idea.

Originally from Chicago, Blades began playing and studying drums at the age of eight, guitar at 13 and organ at 18. He studied at the New College of California and the Berklee College of Music in Boston. He teaches at the Berkeley Jazz School and plays in a number of different groups including Wil Blades Trio, O.G.D., Steppin' and BluesBeat. Blades can be seen performing regularly as the house organist at John Lee Hooker's Boom Boom Room.

THE BIG PICTURE

Whether they know it by name or not, when people think of electric organs in jazz and popular music, they are probably thinking of the Hammond B3 organ.

In the 1930’s, the Hammond Organ Company of Evanston, Illinois created a line of organs for leisure use by people in their homes and as an affordable alternative to large pipe organs for churches. In 1955 the Hammond B3 was introduced and quickly become identifiable as the classic organ sound in many musical genres.

Weighing in at over 400 pounds, the Hammond B3 has an astonishing number of features. There are two 61-note keyboards (called manuals), the upper keyboard called the swell and the lower
the great. Nine preset keys for both keyboards, two sets of nine drawbars, or stops, for each manual, a set of twenty-five foot pedals operated by the left foot (with two pedal drawbars), a volume, or expression pedal operated by the right foot, and a separate external speaker with rotating horns and a bass woofer inside.

The heart of the instrument is equally complex. The basic internal mechanism of the B3 is based on its predecessor - Thaddeus Cahill’s Telharmonium – a larger electric organ which utilized a device called a tone wheel to generate sounds. The tone wheel is a notched wheel, which spins around beneath an electromagnetic magnet, or pickup, creating a waveform that is then sent through a series of mixers and filters, producing the final sound. There are 91 tone wheels inside the console, each one with a specific configuration of notches. The notches are designed to disrupt the electromagnetic field in a particular way, producing a sine wave that correlates to a musical pitch.

Each note on an organ consists of the fundamental, or the lowest frequency of a periodic wave, and a number of harmonics, or multiples of that frequency. The Drawbars are mechanisms or, stops, of an organ, which literally can be “drawn” or pulled out of the organ console to any one of eight positions. On the B3, there are nine drawbars, each one of them correlating to and controlling a specific harmonic pitch, either the third, fifths, or roots of any given note played on the organ’s keys. By pulling the drawbar out all the way, you increase the volume of that particular harmonic. Push the drawbar all the way in and there is silence. By altering the levels and volumes of the different harmonics, one can create literally thousands of unique sounds, some like a string instrument, others like a voice or a reed instrument, others more brassy like a trumpet or trombone. The phrase “pulling out all the stops” refers to pulling out all nine stops, creating as loud a sound as you can get on all the harmonic frequencies of the notes played. In practice, a player can “voice” each stop as he/she plays, meaning they can make changes to any of the drawbars while playing, or they can preset the sound quality using the preset keys.

To further complicate matters, the sound generated by the Hammond B3, on its own, was not audible without the use of an external speaker. Although Hammond made their own, The Leslie Corporation made a better version that soon became synonymous with the Hammond. The most popular model was the Leslie 12. Standing approximately six feet high, it contained two rotating treble horns at the top, a bass woofer and another pair of rotating horns at the bottom. The rotation was critical to ensure that the vibrato effects coming from the organ could be heard. The horns could rotate at two speeds only, fast and slow, but their effect was essentially as important as the organ sound itself. Players had to master not only the art of playing the organ, but their sound could be further identified by how they set up and used their Leslies.

The incredible structure of the Hammond B3 meant that one player could play a solo with his/her right hand, comp or accompany himself with the left, and play the bass line with his left foot and the volume with the right. Add a drum set and maybe a guitar or another instrument for contrast, and you had a complete band.

Even before the Hammond came on the scene, the groundwork was laid for its evolution into jazz.

Fats Waller was proficient on the pipe organ from his church experience and from playing theatre organs for silent movies. He was one of the first to initiate the use of the organ in early jazz, followed closely by Count Basie, who took Waller’s stride piano style and adapted it to work in a jazz band that played jump and swing.

The Hammond’s presence in black gospel churches secured its entry to the world of
rhythm and blues and jazz. Its unique sound, tonal stability, versatility, capacity of expression and relative portability (if one considers a 400 pound instrument portable) offered a unique position for those who could master it. 

By the 1930’s and 40’s, Hammond organs were everywhere – every radio station used them for their live radio programs – and they appeared in more and more jazz bands.

By 1949, Wild Bill Davis, previously an arranger and pianist for Louis Jordan, brought his big-band style and rhythm and blues sound to the organ, wowing audiences with his large chords and big volume, essentially mimicking the big-band with his one instrument.

The Hammond B3 came out in 1955, and close on its heels came one of its most influential masters. In 1956, a young player named Jimmy Smith came on the scene, and revolutionized the way people played organ. He brought to the Hammond a bebop style of playing, and added a walking bass line using the foot pedals. Smith’s debut brought about a sort of “golden age” of organ playing and influenced a huge number of organists, including Richard “Groove” Holmes, Charles Kynard, Jack McDuff , Jimmy McGriff, Don Patterson, John Patton, Sonny Phillips, Freddie Roach, Shirley Scott, Johnny "Hammond" Smith, and Dr. Lonnie Smith.

Not only jazz benefited from the organ – throughout the 60’s and 70’s the instrument’s appeal to a broader musical market was evident as it appeared in surf music, blues, rock and roll and soul music from such personalities as Ray Charles, Keith Emerson (Emerson, Lake and Palmer), and Steve Winwood (Traffic, Blind Faith) who you can also hear on recordings of Jimmi Hendrix (Voodoo Child) and Joe Cocker (With a Little Help From My Friends).

The Hammond B3’s popularity waned throughout the 70’s and it was taken off the assembly line in 1975. However, it has been re-issued in the last decade by the new Hammond-Suzuki company, and although it has a new digital tone wheel, it has apparently been made to match the sound of the original to quite an impressive extent.

Its appeal has not been forgotten, in fact it appeared to be experiencing a return to the spotlight in the 1990’s as older jazz players began coming back to its unique sound. Rock bands also seemed to be interested in the Hammond, from the Black Crowes to Phish to Eric Clapton.

However, of the new young jazz musicians, Wil Blades is one of the few carrying on the tradition of the Hammond B3 legacy. All in all it is a formidable instrument technically and not easy to take to transport. But due to its versatility and sheer funky sound, it seems that after 50 years of existence the Hammond B3 is poised to survive in a small but solid niche.

RESOURCES – TEXTS


RESOURCES – WEB SITES


Dr. Lonnie Smith’s official website. [http://www.drlonnie smith.com/](http://www.drlonnie smith.com/)

PBS series called the “Legends of Jazz”, this program is on the Hammond B3 organ and its proponents, such as Dr. Lonnie Smith and Joey DeFrancesco. [http://www.legendsofjazz.net/television/TheKillerBs](http://www.legendsofjazz.net/television/TheKillerBs)


A bit dated (1988) but very interesting site with a lengthy history of jazz organ, written by Geoff Alexander. [http://www.afana.org/jazzorgan.htm#INTRODUCTION](http://www.afana.org/jazzorgan.htm#INTRODUCTION)


BAY AREA RESOURCES

The Boom Boom Room, a night club that features live music and dancing. 1601 Fillmore Street, San Francisco. [http://www.boomboomblues.com/](http://www.boomboomblues.com/)


The website for the Live Oak Park Fair happening on June 11th, 2006 – a free event for families. Wil Blades will be appearing there. 1301 Shattuck Ave., Berkeley. [http://www.liveoakparkfair.com/](http://www.liveoakparkfair.com/)

DISCOGRAPHY

Basie, Count. *Super Chief*, Columbia G 31224

Buckner, Milt. *Chicago, March 1961*, Musidisc 30 JA 5166 (France)


McGriff, Jimmy. *Dueling Organs (with Groove Holmes)*, Quintessence 25261.

Bass line
The musical line played by the bass in a band or sometimes played by another instrument, such as the left hand on the piano or organ. This line is by nature low in register, outlining the chords of the music as well functioning as part of the rhythm section, driving the rhythmic sensibility of the music.

Bass Pedals
On an organ, these are foot pedals that play notes lower than those that are on the keyboard and usually have a different timbre.

Bebop
A style of jazz that emerged in the 1940’s in contrast to the big band era, characterized by complex melodies and chord progressions, more solo opportunities, irregular musical phrases, as well as more emphasis on the role of the rhythm section.

Big-band
An ensemble of 10 or more musicians that play dance music. Although their history dates back over 100 years, during the 1920’s these bands incorporated more saxophones than clarinets, and played more jazz rhythms, blue notes and played arrangements for whatever style was current – from the hot jazz of the 1920’s through the evolution of swing to bebop and the existing contemporary styles today.

Cat
A musician’s slang term for another musician.

Chords
A musical term that denotes a stack of 3 or more notes sounded together.

Fundamental
The lowest frequency of a periodically varying quantity or of a vibrating system.

Drawbars
Also called “stops” on an organ, drawbars add harmonics to each note naturally produced on the keyboard. These mechanisms can literally be “drawn” or pulled out of the organ console to any one of eight degrees. There are nine drawbars, each one representing the nine most important harmonics of a note. This in turn affects the harmonics of each note played, giving the player the opportunity to alter the sound of the notes and to mimic virtually any instrumental tone.

Foot Pedals
On musical instruments such as organs, pianos, vibraphones and some electronic instruments, foot pedals are used to control aspects of the production of the sound of the instrument, and are operated by the feet. In the case of the Hammond,

Gig
A job in which a musician performs for money.

Jimmy Smith
Also called “the Incredible Jimmy Smith”, (December 8, 1925 – February 8, 2005) was a jazz musician, organist and recording artist. Smith is credited with legitimizing the Hammond B-3 as an improvisational instrument in jazz.

Lead
The main melodic line or improvisation in a piece of music.
Legacy
Something handed down from an ancestor or predecessor or from the past.

Organ
A musical instrument consisting of a number of pipes that sound tones when supplied with air and a keyboard that operates a mechanism controlling the flow of air to the pipes.

Soul
A musical term characterizing a performance which has profound emotional depth. It also refers to a style of music which emerged in the 1960’s, from within the African–American community which fused elements of gospel with rhythm and blues.

Soul Jazz
An extension of a jazz style called hard bop, soul jazz developed in the late 1950’s and merged elements of gospel and rhythm and blues with hard bop, but was characterized by less complicated improvisations and repetitive grooves.

Summit
A conference or gathering at the highest level, in this case, a gathering of the highest caliber of musicians.

Swing
A style of music for a fast-paced partner dance which emerged in the 1930’s and was played by big-bands.

“Trading licks”
The act of alternating short solo lines almost in a “conversational” style, each performer responding to the other’s musical statements and ideas.

Wild Bill Davis
(24 November 1918–17 August 1995) was the stage name of American jazz pianist, organist, and arranger William Davis. Prior to Jimmy Smith’s rise to fame, Davis was one of the first to incorporate the organ as a part of the standard jazz bands in the 1930’s.
SECTION IV – ENGAGING WITH SPARK

An electromagnet functions the same way, except that it only works when there is an electric current running through it.

There is a great experiment you can look at on the “How Stuff Works” website that describes how to create your own electromagnetic field, using a battery, a compass and some wire:
http://science.howstuffworks.com/electromagnet2.html

After understanding the basic principles of electromagnetic fields, bring in an electric guitar (which functions in a similar way to the Hammond, but uses strings and not tone wheels to create disturbances to the electromagnetic field) and an amplifier for a hands-on demonstration of how electromagnetic fields work in the creation of music. If you don’t have one, chances are one of your students will.

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<td>Grades 9-12, Physics</td>
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<td>Waves</td>
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<td>4d – Students know sound is a longitudinal wave whose speed depends on the properties of the medium in which it propagates. Electric and Magnetic Phenomena</td>
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<td>5d – Students know the properties of transistors and the role of transistors in electric circuits. Electric and Magnetic Phenomena</td>
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<tr>
<td>5f – Students know magnetic materials and electric currents (moving electric charges) are sources of magnetic fields, and are subject to forces arising from the magnetic fields of other sources. Electric and Magnetic Phenomena</td>
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<tr>
<td>5g – Students know how to determine the direction of a magnetic field produced by a current flowing in a straight wire or in a coil. Electric and Magnetic Phenomena</td>
</tr>
<tr>
<td>5h – Students know changing magnetic fields produce electric fields, thereby inducing currents in nearby conductors. Electric and Magnetic Phenomena</td>
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Research on electronic instruments
Split the class into different groups and have each group take on a period of time to research in the history of electronic instruments, using the resource list as a starting point. Have each group present their findings in the form of an oral presentation with audio samples of the music they find. Include a detailed discussion of the acoustic and physical attributes of each of the instruments they discover, such as the Theremin, tone wheels, the first electric organs, heterodyning, vacuum tubes, the first synthesizers, MIDI, etc. Challenge students to present a visual presentation as well to help explain the physical action of the electro-magnetic fields or sound waves or other acoustic functions.

**Being an organ**
Break up the class into groups of four students. Have each group imagine that they are really part of one instrument. Use three instruments such as xylophones, glockenspiels, or marimbas for and set up a microphone in front of the ensemble. Have one student play a repeated ostinato figure, or bass line on one instrument, outlining a simple pentatonic chord or for older students’ blues chord. Instruct another to play the same chord but repeated rhythmically as an accompanying or comp instrument. Have a third play a “solo” on top of those two. Have a fourth control the volume of the microphone according to what he/she hears is happening in the music. Rotate the students so that everyone gets a chance to see how complex it would be to play all the parts simultaneously on a single instrument such as the organ.

**SELECTIVE LISTENING**
Select some of the listening samples from the discography choosing a range of time periods or players. Facilitate a discussion on how mood and emotion are established through the music. Examine how different performance styles and “voicings” of the organ sounds create an emotional tone to the music, “soul”, as well as tension and release. What are their general reactions? Ask the students how the music makes them feel. Which recordings do they like best/worst and why? Avoid words such as “good” or “bad”, but challenge to use music terminology to describe and discuss the different recordings.

**Madrigal: Vocal play and improvisation**
This is a theatre exercise that can be used to get students to be musical and improvise together, as well as give them a sense of being part of one mechanism.

Break the class up into groups of four or five. Depending on the number of students in the group, pose questions to each one, such as:

Q: “What was a major headline today?”
A: “Bush to veto spending bill.”

Create a musical “madrigal” by layering each answer on top of another. For instance, the first person sings a basic repeated figure using, “mashed potatoes, mashed potatoes” in any style the students determine to be appropriate – classical, do-op, blues, etc. The second person layers “Bush to veto spending bill” on top, using the same key but a different rhythm. Continue to add another part and keep this going until you have a good groove going, then see if students can take it further by improvising some additional melodic lines or by changing keys. Switch groups and try different answers to the questions.

**Discussion on the sound of the electric organ**

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<td><strong>Grade 2 – Creative Expression</strong></td>
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<td>2.4 – Improvise simple rhythmic and melodic accompaniments, using voice and a variety of classroom instruments.</td>
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</tbody>
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| **Grade 4 – Artistic Perception** |
| 1.2 – Read, write, and perform diatonic scales. |
| 1.3 – Read, write and perform rhythmic notation, including sixteenth notes, dotted notes, syncopation. |

**Sparklers!**
Topics for further research or exploration
- Overtones or harmonics are exploited in many different musical contexts. Listen to recordings of Tuvan throat singers for an immediate example of how the voice itself is comprised of a fundamental and different overtones and how you can manipulate the sounds using vowel shapes in the mouth. Guitarrists use harmonics for special, delicate, high notes beyond the natural range of the strings. Seek out other examples of harmonics in action and examine how they are used for effect and how they are created.

See: http://www.indiana.edu/~savail/workingpapers/tuva.html for info on Tuvan throat singing.

- Have students research current jazz groups as well as their favorite contemporary and pop bands to find examples of Hammond B3 playing. Who is playing it now?

For more information about SPARK and its educational content, including the Visual & Performing Arts Standards, visit the Web site at http://www.kqed.org/spark/education.

For more information about the California Visual & Performing Arts Standards, visit the CA Dept. of Education at http://www.cde.ca.gov/be/st/ss/index.asp.

**MUSIC - RELATED STANDARDS**

Grade 2 – Artistic Perception, Aesthetic Valuing
Standard 1.0 - Listen to, Analyze, and Describe Music
1.3 Identify ascending/descending melody and even/uneven rhythm patterns in selected pieces of music.
Standard 4.0 - Derive Meaning
4.3 Identify how musical elements communicate ideas or moods.

Grade 6 – Aesthetic Valuing
4.2 Explain how various aesthetic qualities convey images, feeling or emotion
4.3 Identify aesthetic qualities in a specific musical work.
Grades 9-12, Advanced – Aesthetic Valuing
4.1 Compare and contrast how a composer’s intentions result in a work of music and how that music is used.

**RELATED STANDARDS**

**MUSIC**

Grade 2 – Artistic Perception, Aesthetic Valuing
Standard 1.0 - Listen to, Analyze, and Describe Music
1.3 Identify ascending/descending melody and even/uneven rhythm patterns in selected pieces of music.
Standard 4.0 - Derive Meaning
4.3 Identify how musical elements communicate ideas or moods.

Grade 5 – Aesthetic Valuing
Standard 4.0 – Derive Meaning
4.2 Develop and apply appropriate criteria to support personal preferences for specific musical works.

**Grades 9-12, Proficient** – Artistic Perception, Creative Expression, Historical and Cultural Context
Standard 1.0 – Read and Notate Music
1.5 Identify and explain a variety of compositional devices and techniques used to provide unity, variety, tension, and release in aural examples.

Standard 2.0 - Compose, Arrange, and Improvise
2.6 Compose music, using musical elements for expressive effect.
2.7 Compose and arrange music for voices or various acoustic or digital/electronic instruments, using appropriate ranges for traditional sources of sound.

**MUSIC – RELATED STANDARDS**

Grade 3 – Creative Expression
2.2 Sing age-appropriate songs from memory, including rounds, partner songs, and ostinatos.
Grade 4 – Creative Expression
2.3 – Compose and improvise simple rhythmic and melodic patterns
Grade 6 – Creative Expression
2.6 – Improvise simple melodies