

**THE MATHEMATICS OF RHYTHM:**  
Using Rhythm to Support the Teaching of Math

***Encounter -Learning Rhythm Blocks, Four Down Warm-Up***

(see Rhythm Block Charts and <http://www.crosspulse.com/pdfs/Part1.pdf>)

**Ideas for Teaching Rhythm Blocks to Student**

1) A Minute Here and a Minute There

- a) **Four Down** warm up takes a minute and a half! Use it to practice whenever you have a couple minutes until you feel comfortable enough with the *Rhythm Blocks* to teach them to your students.
- b) Refer to the **Rhythm Blocks Chart** as a memory aid for:  
Clap, Chest, Chest, Thigh, Thigh, Butt, Butt, Step, Step.

**Mid 2nd - 5th**

- 2) Option: Start by teaching the *Rhythm Blocks* on one side.
- 3) In class, use "in between" times to practice using **Four Down** warm up.
- 4) Use "My Turn, Your Turn, Our Turn" when teaching and practicing rhythms.
- 5) Post a "Rhythm Block Chart" for your students to use when first learning.
- 6) *Rhythm Blocks* can also be practiced when sitting down.

**K- 1**

- 2) The teacher can play the *Rhythm Blocks* as an accompaniment to her/his verbal and visual explanations during math activities.
- 3) Use the "unit of beats" idea to create rhythm blocks for your young students. Have students play these simplified rhythm blocks to accompany games or rhymes **Example: Hickory Dickory Dock** .
- 4) *Rhythm Blocks* can also be practiced when sitting down.
- 5) Use "My Turn, Your Turn, Our Turn" when teaching rhythms.

***Observe - Take a closer look at the Rhythm Blocks***

**Qualities of *Rhythm Blocks* that relate to the study of mathematics.**

- 1) Each *Rhythm Block* is a unit (collection, set) of beats.
- 2) The name of the *Rhythm Block* tells the number of beats in the unit.

- 3) Each beat in a *Rhythm Block* is of the same duration (the time between the beginning of one beat to the beginning of the next beat is the same for all beats in the rhythm - steady beat or a steady pulse).
- 4) *Rhythm Blocks* can be put together and sequenced in a variety of ways to create rhythms, rhythmic phrases, and rhythmic compositions.
- 5) The beginning of a *Rhythm Block* is signaled by a clap (accented beat).




UNIT: A group, set, or collection of things that can be thought of as a whole. A five dollar bill is a unit of money composed of 5 one dollars.






BEAT: In this workshop, beat refers to the pulse of a rhythm.

### **Reflect - Create a Visual Representation of a *Rhythm Block***

Create a quick visual representation of your own 5- *Rhythm Block* using symbols, and/or shapes. Try to capture the important properties of a 5-*Rhythm Block* in your representation. EX:

KEY:

 = CLAP (Accented Beat)     = PAT (Unaccented Beat)     = STEP (Unaccented Beat)

My 5-Rhythm     

Creating a visual representation encourages students to consciously think about important attributes of the *Rhythm Blocks*. A *Rhythm Block* is a group (unit) of beats that are of equal duration. There are accented and unaccented beats. The first beat of a *Rhythm Block* is accented.

Have students share their own rhythm block with the class or through "Musical Shares." Students can then create an eight beat rhythm by putting rhythm blocks together. EX

My rhythmic phrase        

5RB + 3RB

### **Rhythm Blocks and Math**

Feeling, Seeing and Hearing Units of 2s, 3s, 4s ...9s.

When playing *Rhythm Blocks* children are hearing, seeing, and feeling in their bodies a collection of beats. These collections come in

units 1s, 2s, 3s, 4s all the way to 9s. *Rhythm Blocks* give students the opportunity to physically experience the mathematical idea of a unit and to express their understanding of units kinesthetically as well as mathematically. The experience of playing these units of beats can be connected to math concepts that are found in the study of:

***Multiplication***- Things that Come in Groups, Repeated Addition

***Measurement***- Measuring time in Music

***Properties of Addition and Multiplication***-Ordering, and grouping rhythm blocks to create rhythms, rhythmic phrases and rhythmic compositions using the identity, commutative and associative properties

***Number Patterns*** - By creating different sequences of rhythm blocks, we not only create rhythms but also numerical patterns that students can recognize, describe, finish and repeat.

***Ratios, Proportions*** - the idea of units sets the groundwork for student understanding of ratios and proportions, which eventually leads to understanding linear equations in algebra.

***Understand*** - Build a rhythmic phrase by grouping *Rhythm Blocks* together.

Use a rhythmic phrase to explore the Commutative and Identity Properties of Addition

**Teach the rhythmic phrase (3,5) (3,5) (5,3) (8)** to the class and have them break into 4 groups with each group taking turns playing one of the group of 8 beats. The entire rhythmic phrase can be played 3 times.

Have students work in pairs to calculate the total number of beats played  $3(8 \times 4)$ . Ask students to share their method of calculating. Lead a discussion about how multiplication can be used as a quicker method of repeated addition.

Introduce the Repeats and Variations Chart and apply it to the **rhythmic phrase (3,5) (3,5) (5,3) (8)**

$$1. \quad (3 + 5) \quad + \quad (3 + 5) \quad + \quad (5 + 3) \quad + \quad (8 + 0)$$

<u>base</u> base rhythm	<u>repeat</u> variation	<u>commutative +</u> variation	<u>identity +</u> variation
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### Questions to ask your students:

What do you notice about the different parts of the rhythm?

What do all the parts have in common?

In what ways are the parts different from one another?

Notate the rhythm using numbers and math symbols. Explain that we are using parentheses to mean "group these together".

This rhythm can be expressed in mathematical language as:

$$(3 + 5) + (3 + 5) + (5 + 3) + 8$$

In the third group of 8, we changed the order from 3, 5 to 5,3. Did it change the number of beats? It didn't matter which order we played the 3RB and the 5RB, it still made 8 beats.

$3 + 5$  and  $5 + 3$  both equal 8.

Have students estimate how many total beats were played when the rhythm was played 4 times. Students then work in pairs to figure out the total numbers of beats played. They can show their thinking by using numbers and math symbols, words, charts, or drawings.

**Create - Extension:** As a class or in pairs, students compose their own rhythm using the structure.

$$(a + b) + (a + b) + (b + a) + c \quad \text{where } a + b = c$$

### Examples

$$(3 + 4) + (3 + 4) + (4+3) + 7$$

## ***Activities***

### **Multiplication as Equal Groups of Objects-** Things that Come in Groups

Teacher and students play the appropriate *Rhythm Block* as students call out things that come in groups of \_\_\_\_.

**Example:** Everyone repeatedly plays the *5-Rhythm Block* while the teacher asks what things come in fives? Students called out things that come in fives:

**Student:** Toes on a foot

**Teacher:** I know toes on a foot come in fives because there are **5** toes on **1** foot.

**Other possible things:** sides of a pentagon, human senses, dollars in a 5 dollar bill, lines on a musical staff, beats in a *5-Rhythm Block*.

### **Multiplication as Repeated Addition (with hand signals)**

Play a *3-Rhythm Block* four times while using one hand to count off the 4 threes. Then do the same thing as you count out loud each beat (1 -12 beats). 3 beats four times is 12 beats.

### **Play the Room with Multiplication**

Look for things in the room that come in groups. Use them as part of a musical improvisation inspired by your surroundings. Write down your improvisation using words, numerical expressions, equations, & pictures.

### **Guess My Pattern**

One of the most important skills needed in mathematics is the ability to discover a pattern, describe it in a way that can be understood and use it to predict what will happen in cases not yet investigated. Individual students show what they think is the next number with a *Rhythm Block*.

**Number sequences- Guess My Rule Examples:**

**1 3 5 ? (Rule add 2)**

**1 2 4 ? (Sequence begins with 1 each number is twice as large as number before) or (Add 1 to the first number, 2 to the second, 3 to the third)**

**7 5 3 ? (Subtract 2)**

# Rhythm Blocks

## Right Side

1

**CLAP**

3

2

**CHEST CHEST**

5

4

**THIGH**

**THIGH**

7

6

**BUTT**

**BUTT**

9

**STEP**

8

**STEP**

## HOW TO PLAY



# Body Percussion

## KEITH TERRY DEMONSTRATES THE RHYTHM INSIDE

BY **SCOTT LOCKLEAR**  
PHOTOS BY **PAUL HAGGARD**

**D**rummers lay claim to one of the oldest art forms on the planet (what, after all, could be more primal than whacking something with a hunk of wood?), but Keith Terry truly returns rhythm to its source. Taking the term *skinsman* to heart, he has turned his own body into a percussion instrument – thigh slapping, hand clapping, and foot thumping his way through complex, dynamic beats that send many a seasoned kit slammer running back to the practice room.

The affable Terry began scaring the hell out of trap players some 30 years ago, when he stumbled upon body music during a rehearsal for a jazz gig. “I realized one day,” the accomplished drummer and dancer remembers, “that I could displace what I was playing on the drums onto my body.” Influenced by everything from Flamenco *palmas* to our own homegrown art of hambone, Terry began quickly developing a unique style of rhythm and movement that he has since incorporated into a wide range of musical settings, including collaborations with heavy-weights such as Bobby McFerrin and Tex Williams as well as with a slew of lesser-

known but no-less-interesting artists – physical comedians, Indonesian and Polynesian dancers, even clowns. Ironically, then, it appears that the frontiers of world and avant-garde music are being marked not by electronics but by the slaps, pops, and stomps of the body.

Now, in case all this sounds like the apocalyptic Second Coming of *Riverdance*, don't flip back to the Chad Smith article just yet. No one hopes to pry those beloved 2Bs from your hands for good, but we do want you to know that getting hip with this whole body-music thing means much more than being able to touch yourself in public. “For me,”

Terry explains, “it really is about internalizing the rhythm. Once you have it inside you, then you can express it in any number of ways – through other instruments or through other dance forms. It's just such a great way to approach rhythm. It really is *embodying*. I feel like you understand [rhythm] on a whole other level when you *are* it.”

So get ready to get inside the beat – and to get the beat inside you – like never before. Follow along as we present the basics of Terry's body music, introduce a few of his advanced moves, and then give a glimpse of the man himself putting it all together in a performance setting. >>

# HOW TO PLAY

## BEGINNER NOTES

Throughout the following exercises, a very important drumming principle holds true: Don't do anything that hurts. Stretch before attempting any of the moves, and remember to stay relaxed. Speed comes when you are tension free.

Also keep in mind that body music is inherently a softer-sounding, lower-volume art form. If the more adventurous among you are thinking about performing live, feel free – and be ready – to experiment with different microphones. Even Terry finds the right miking

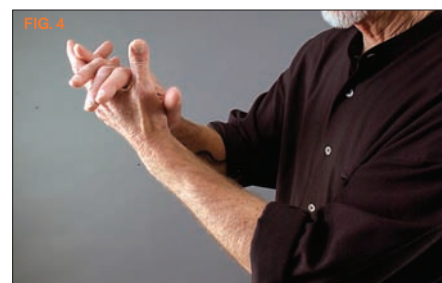
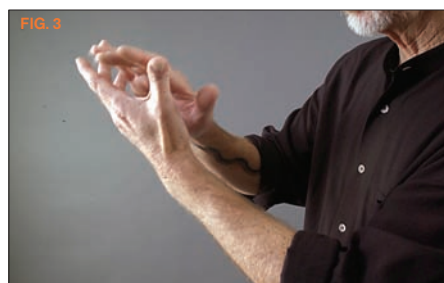
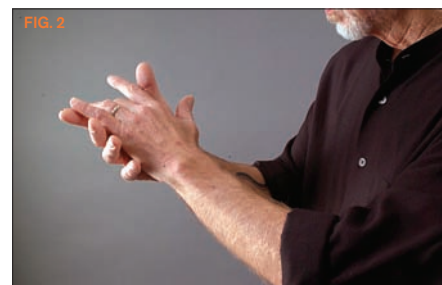
setup to be a challenging work in progress, particularly when he plays on stage with other people and other instruments. "It's easy to get buried," he cautions. So your Slipknot cover band might not be the best place to start incorporating these exercises.

## Basic Vocabulary

Each sequence of figures demonstrates the basic moves and body parts that will have you up and jamming in no time. First off, wear a lighter-weight shirt when practicing and performing (the heavier the material, the more muffled the sound). As for pants, Terry recommends jeans for a good slap sound. Next, think of each body part and striking technique as a way of emulating a sound from your drum set. Finally, remember to watch the force at which you strike: The goal is to make sounds and ultimately music, not to put yourself in the hospital.

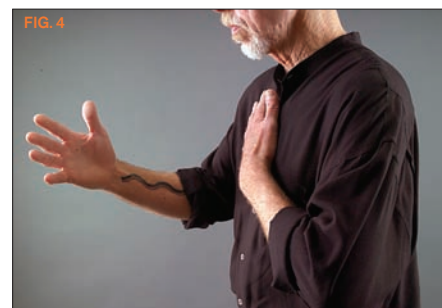
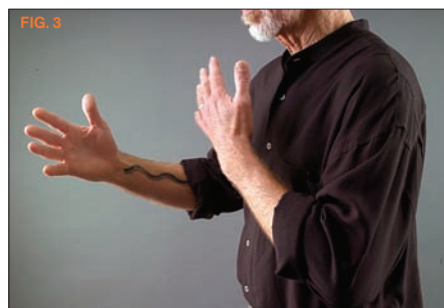
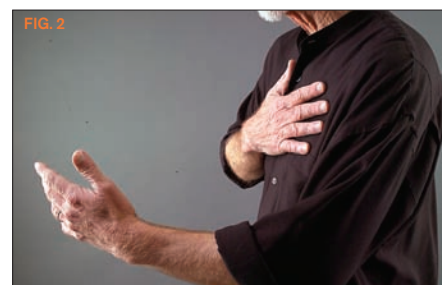
### HANDS

The handclap replicates the highest, sharpest sounds of your kit – snare drum and hi-hat. There are a number of different clapping sounds possible and a number of different ways to clap. Variations in sound can easily be produced by cupping your hands, which Terry encourages because it saves some wear and tear on your paws if you're clapping a lot, and it also evens out the tones. In terms of which hand goes on top, experiment a bit to find what works best for you. **FIGS. 1 AND 2** demonstrate the left hand on top (or left-hand lead); **FIGS. 3 AND 4** demonstrate the right hand on top (right-hand lead).



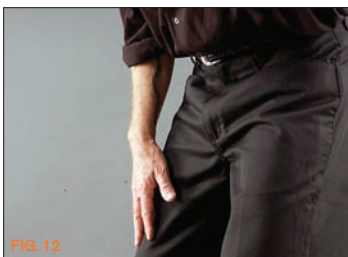
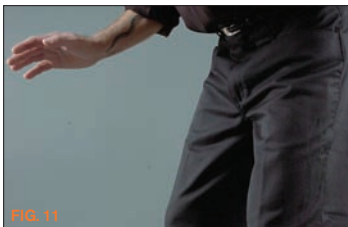
### CHEST

The chest strike simulates your highest rack tom. It should be focused in the center of the chest, right in the sternum (see **FIGS. 5-8** for right- and left-hand lead, respectively). "You get the best sound there," Terry insists, and it's also where you get the most efficient, economical range of motion, particularly if you are looking to eventually gain speed. Again, remember to cup your hands if necessary so that you're not pounding your chest too hard.



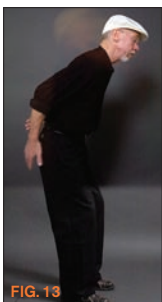
## THIGHS

The thigh strike (FIGS. 9-12) is equivalent to your middle tom. The sound can change dramatically depending on whether or not your hands are cupped.



## BUTT

Yes, in body drumming your tush is good for more than just parking on a throne. Pitch-wise, the butt is the lowest of the toms. Be sure to hit all cheek (FIGS. 13 & 14) and not cheat by aiming for the front or back of your hips. (Think of this as the spanking you probably deserve anyway.)



# GROOVE ANALYSIS

BY BRAD SCHLUETER

## BODY JAMS

This body-music samba (Ex. 1) is fun, fairly easy to do, and will get your fingers and feet fired up and flexible. To hear an audio version of the body samba, check out the first cut from Terry's latest CD, *SLAMMIN All-Body Band*. Ex. 2, a trio piece, is a great way to explore ensemble playing and listening to others in a body-music context. In Part 3 of Ex. 2, right- and left-hand snaps are indicated in parentheses above the note.

Key

Snap Clap Right Left Right Left Right Left Right Left  
Chest Chest Thigh Thigh Butt Butt Foot Foot

Ex. 1

Ex. 2 Part 1

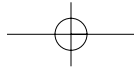
Part 2

Part 3

## FEET

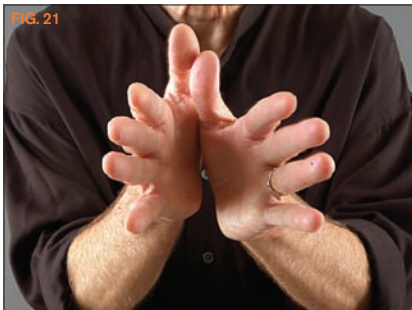
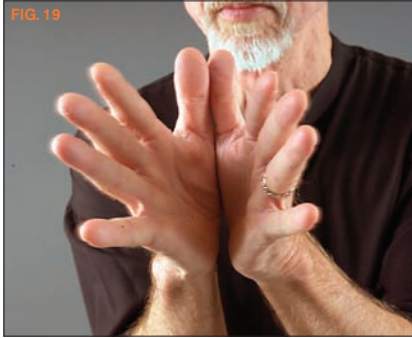
Not surprisingly, the foot stomp replicates your bass drum. Terry recommends wearing hard-rubber-sole or hard-leather-sole shoes, and for some nice low end, he prefers playing on a hardwood floor, "preferably sprung so that it gives a little" and saves the knees. The basic step is grounded and very flat-footed, where your weight is almost on your backside (FIGS. 15-18). You can also just use your heel by keeping your toes on the floor. The sound will not be as powerful as when you lift your entire foot (somewhat like whether you play heel up or heel down on your kit). For semi-advanced moves at this point, try playing hand and foot vocabulary together for different sound combinations.



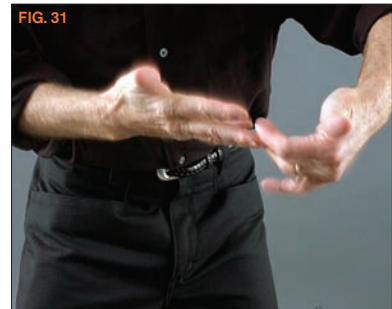
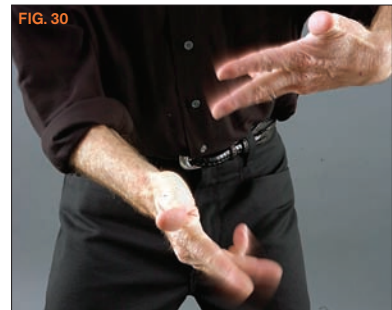
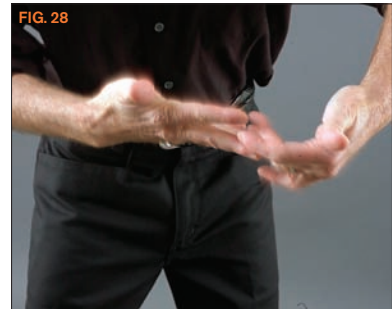
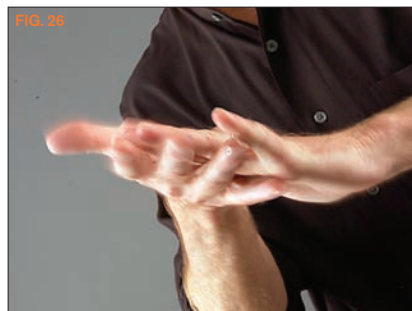
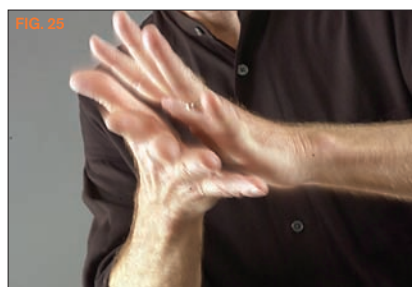
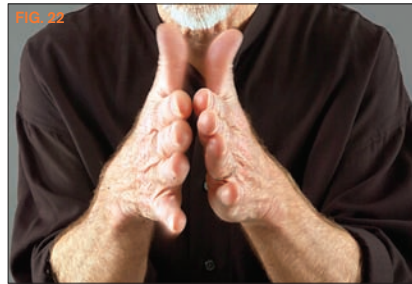


# HOW TO PLAY

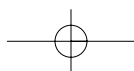
## Advanced Hand Vocabulary



Now that your hands are limber, get ready to do some serious smacking. The first sequence (FIGS. 19-23) is a finger technique that produces a lighter cupping sound than the handclap. Be sure to keep your fingers relaxed. The second sequence (FIGS. 24-26) is a swift move that creates a sound akin to brushes on your snare. If you're really serious about body music, you might want to think about giving up the hand lotion, because according to Terry, it helps the swish if your digits are a bit dry. "Mine will shred you if I touch you," Terry confesses. The third sequence (FIGS. 27-31) is an alternative way to make a brush sound.



CONTINUED ON PAGE 74 >>



# HOW TO PLAY

## PERFORMANCE

Though not fully doing justice to Terry's music making, the following set of stills is a sample of where you can take body percussion in performance (FIGS. 32-60). Some athleticism is required for the jumps (FIGS. 50-57), and remember that it is above all a performance, so don't be afraid to improvise and be dramatic – twirl, spin, whirl as appropriate to the emotion that you want to convey. To see the man in true motion, log onto [crosspulse.com](http://crosspulse.com) and pick up a copy of Terry's instructional DVD, *Body Music, Part 1*. ■



FIG. 32



FIG. 33

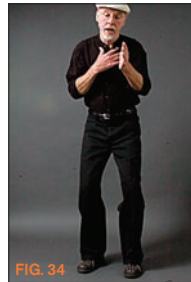


FIG. 34



FIG. 35



FIG. 36



FIG. 37



FIG. 38



FIG. 39

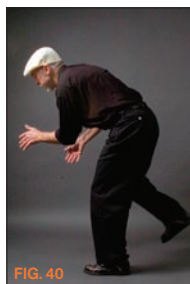


FIG. 40



FIG. 41



FIG. 42



FIG. 43



FIG. 44



FIG. 45



FIG. 46



FIG. 47



FIG. 48

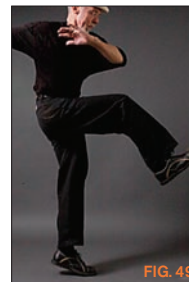


FIG. 49

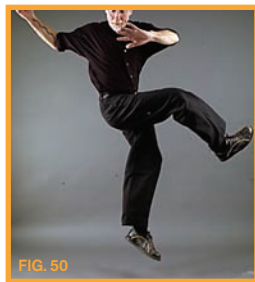


FIG. 50



FIG. 51

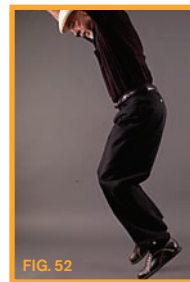


FIG. 52

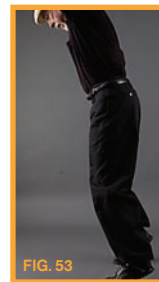


FIG. 53

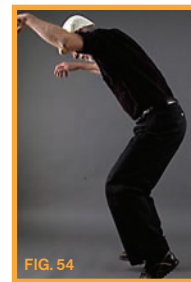


FIG. 54

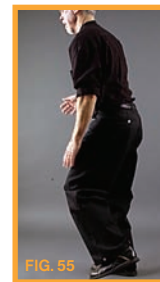


FIG. 55



FIG. 56



FIG. 57

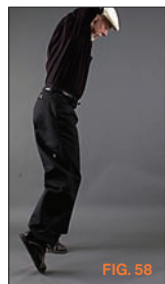


FIG. 58



FIG. 59



FIG. 60