Lesson Title: Cuttin' a Rug with Integers	**<u>Big Idea & Learning Objectives</u>** 1. Students will explore the movement of integers on a number line through addition and subtraction. 2. Students will add and subtract integers on a number line. 3. Students will incorporate movement into the modeling of addition and subtraction of integers.
Content Area & Arts Discipline: Math and Dance/Movement	**<u>Overview of the Lesson</u>** The students will model the addition and subtraction of integers on a number line using body movement. The students will create a specific movement to represent positive integers and will create a specific movement to represent negative integers.
Grade Level: 7th Grade adaptations for 6th and 8th grades given at the end of the lesson	**<u>Procedures</u>** **Engaging Students ("The Hook"):** The teacher will have a number line taped to the floor prior to the students' arrival. The students will sit in groups around the number line. The teacher will begin class with the topic of line dancing -- What is it? What type of music is often found with line dancing? Does it always have to be country music (i.e., Cha-Cha Slide, Electric Slide are not country)? What makes line dancing unique? The teacher will transition into a discussion about the number line and how it can be used to model addition and subtraction -- Which way is addition/ subtraction? Which way is positive/negative? Students will allowed to think about and discuss: How can line dancing connect to addition and subtraction?

Proposed Time Frame: < 2 hours (1-2 class periods)	**Building Knowledge:** The teacher will facilitate a discussion on how addition moves to the right of a number line and subtraction moves to the left of a numbers line and will continue with how positive numbers move up and negative numbers move down. The teacher will facilitate a discussion on how dance moves can move a dancer to different locations of a dance floor. The teacher will have students create movements for positive numbers and negative numbers For example, a positive number might do a bunny hop and a negative number might do the moonwalk. Direction on a number line will be determined by the addition (face right) or the subtraction (face left) of the given expression.
Date Lesson Created: August 12, 2013	**Modeling the Experience:** The teacher will have pre-made dance moves for a given expression. The teacher will show students how to work through an addition problem (-1 + 3) and a subtraction problem (2 - (-1)) using pre-determined movements (bunny hop for positive and moonwalk for negative).
Lesson Author: Shasta Long -classroom teacher Julie White -teaching artist (dance/ movement)	**Guided Practice:** The teacher will guide students through the process of solving these problems: 2 - 3, -2 + (-2), 3 - (-2), -1 + 4. For the problem 2 - 3, the students will begin at the 0. 2 is positive, so the students will do a bunny hop to the 2. Since the problem is subtraction, the student will face to the left. Since a positive 3 is being subtracted, the student will bunny hop three places forward and end at the -1. The teacher will continue leading the students through the remaining three problems.
	Applying Understanding: Students will be placed in small groups and will be given a word problem. The students will be responsible for writing the expression needed to solve the problem and will need to create movements to model their problem. The students can choose to either teach the class about their problem (encouraged) or teach the teacher.

Room Requirements & Arrangement: classroom -desks need to be pushed to the edge of the classroom to create an open space with a number line marked on the floor	**Opportunities for Reflection (Closing):** •Students will discuss how the dance movements connect to the movement on the number line in order to develop connections to more complex math problems that will be completed in class. •Students will be a proper audience for classmates.
Material Equipment: •painters tape to create number line •cards with addition and subtraction problems •cards with word problems	**Assessing the Learning:** •The teacher will observe students as they use movement to create a physical model of the addition and subtraction of integers. •The students will model a given problem to the class or to the teacher. •Students will discuss key words that led them to solving given word problems. •The students will also be graded on their participation in the audience.
Resources: •JBHM Mathematics -- level 7	**<u>Standards & Principles</u>** **Common Core State Standards:** **6.NS.3 Number System** Standard: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.NS.7 Number System** Standard: Understand ordering and absolute value of rational numbers. **7.NS.1 The Number System** Standard: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **8.NS.2 Number System** Standard: Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. **Arts Standards:** **Dance: Middle Level III** **1 - Demonstrate an understanding of movement skills while applying anatomical knowledge and correct terms. (CP, C)** **a.** Develop and demonstrate an understanding of movement initiation. **e.** Demonstrate and recognize planes in space: vertical, horizontal, sagittal. **6 - Perceive, practice, and advocate an appreciation for the creation, beauty, and value of dance.** **c.** Exhibit proper audience and performing arts etiquette.

Vocabulary (math): •addition •expression •integer •negative •net gain/loss •positive •subtraction **Vocabulary (music):** •direction •movement	**Principles of Universal Design for Learning**: I. Provide Multiple Means of Representation 2: Provide options for language, mathematical expressions, and symbols 2.1 Clarify vocabulary and symbols 2.3 Support decoding of text, mathematical notation, and symbols 3: Provide options for comprehension 3.1 Activate or supply background knowledge 3.2 Highlight patterns, critical features, big ideas, and relationships 3.3 Guide information processing, visualization, and manipulation 3.4 Maximize transfer and generalization II. Provide Multiple Means of Action and Expression 4: Provide options for physical action 4.1 Vary the methods for response and navigation 5: Provide options for expression and communication 5.3 Build fluencies with graduated levels of support for practice and performance 6: Provide options for executive functions 6.2 Support planning and strategy development III. Provide Multiple means of engagement 7: Provide options for recruiting interest 7.1 Optimize individual choice and autonomy 7.2 Optimize relevance, value, and authenticity 7.3 Minimize threats and distractions 8: Provide options for sustaining effort and persistence 8.1 Heighten salience of goals and objectives 8.2 Vary demands and resources to optimize challenge 8.3 Foster collaboration and community 8.4 Increase mastery-oriented feedback 9: Provide options for self-regulation 9.1 Provide expectations and beliefs that optimize motivation 9.3 Develop self-assessment and reflection

Appendix

Extended Learning Activities:

•Students will write word problems using the addition and subtraction of positive and negative numbers and will develop corresponding movements. The students will play a game of round robin and will move to another group and try to solve the problem that was created. This would also be a good time for students to be able to give constructive feedback to each group on how to modify and improve their problem.

TIPS/FAQs:

•If the room is large enough, have the number line begin at -20 and extend to +20.

•If the teacher has the facility, the football field would be a fun location to complete activities like this since they are already marked by yard line. This would allow students to make larger and louder movements as they work.

References:

•JBHM Mathematics -- level 7

Ways to Adapt:

•6th grade - instead of marking positive and negative integers, create a number line split into fractional sections and have the students practice the addition and subtraction of decimals (6.NS.3) and ordering rational numbers (6.NS.7)

•8th grade - use the number line to identify the location of irrational numbers (8.NS.2); have the students determine a simple movement to represent each whole number on the number line; students can be given an irrational number to locate on the number line; once located, the students are to combine the movements of the two whole numbers that the irrational number is found between; it is recommended to give odd numbers a movement that involve the upper-half of the body and even numbers a movement that involve the lower-half of the body so that the movements can be easier to combine by the students

$1 + (-2)$	$2 - 1$
$-3 + (-5)$	$-6 - 4$
$1 - 3$	$-4 + 1$
$3 + (-6)$	$3 - 5$
$-7 + (-2)$	$-2 + 2$
$-2 + (-2)$	$2 + 2$
$-4 - 6$	$5 - 10$
$-10 + 5$	$3 + (-4)$

Stock in the Eagles Printing Company rose and fell each day during the first week of June. The following is a summary of its growth and decline.

Day	Gain/Loss
Monday	+4
Tuesday	-8
Wednesday	-1
Thursday	+5
Friday	+7

What integer represents the net gain or loss of the stock?

Integer Incorporated Stock Values rose and fell during the second week of September. The following is a summary of its growth and decline.

Integer Incorporated Stock Values	
Monday	+6
Tuesday	-8
Wednesday	-1
Thursday	+0
Friday	+2

What integer represents the net gain or loss of the stock?

The football team gained 8 yards on the first play of the game. On the second play of the game, they lost 14 yards. On the third play of the game, the team gained 10 yards and received a 5 yard penalty. What integer represents their total yardage after the three plays?

In an experiment, the temperature rose 12º, dropped 10º, and then rose another 5º. If the beginning temperature was -5º, what was the final temperature?

A college football team records the outcome of each play. A summary is shown.

Down	Result
1st	lost 1 yard
2nd	lost 6 yards
Penalty	lost 5 yards
3rd	gained 8 yards
4th	_____

What integer represents the net gain or loss after the third play?