

STRATEGIES FOR CONNECTING ACTIVITIES



in Physical Education and the Classroom

By Brenna Cosgrove and
Jessica Richards

In recent years there has been growing evidence of a link between engagement in physical activity and learning in children (Eveland-Sayers, Farley, Fuller, Morgan, & Caputo, 2009; Jensen, 2000). That is, higher math scores were associated with faster 1-mile times and greater scores on muscular fitness assessments in third- through fifth-grade students (Eveland-Sayers et al., 2009). Because of this connection, it would seem obvious that physical education would be a valued part of the whole school program, given that classroom learning is often sedentary in nature. However, with the increasing emphasis being placed on students' performance on standardized test scores, non-tested subjects such as physical education are being relegated to secondary status in many schools. This is often characterized by cuts in curricular time and funding, both of which impact the quality of physical education students receive.

In order to preserve the quality of their physical education programs and improve their status within a school, physical education teachers must advocate for themselves and the field. Lux (2010) has described five strategies that serve to improve physical education's status, with one of these being to "extend the olive branch." In this case, Lux suggested that physical education teachers proactively offer help to and build alliances with classroom teachers in order to promote the entire school mission. The purpose of this article is to present teachers with a series of strategies they can utilize in physical education that help to integrate and reinforce classroom content in mathematics, English language arts, science, and social studies, but without compromising physical education's mission of the development of competent and enthusiastic movers. The key lies in designing tasks that stay true to the discipline of physical education but make intellectual and practical sense to incorporate content from other disciplines. As Ackerman (1989) described, integration meaningfully connects two (or more) content areas and does not sacrifice one for the sake of the other.

There are a number of examples where physical education has been the site of the successful integration of physical education and different classroom content areas (Derri, Kourteessis, Goti-Douma, & Kygiridis, 2010; Finkenbergr & Fortes, 2003; Gagen & Getchell, 2008; Hastie, 2013; Hollett, Sluder, Taunton, & Howard-Shaughnessy, 2016; Howard-Shaughnessy & Sluder, 2015, Rovegno & Gregg, 2007; Wade, 2016). One particularly successful long-term example occurred where a sport education gymnastics season was used to connect with the life sciences content of students in second through fifth grade at one elementary school (Hastie, 2013). In this study, the classroom teachers described how the integration allowed for expanded coverage of content with greater depth, reinforce-

The purpose of this article is to present teachers with a series of strategies they can utilize in physical education that help to integrate and reinforce classroom content in mathematics, English language arts, science, and social studies, but without compromising physical education's mission of the development of competent and enthusiastic movers.



© Stockphoto/bizoo_1

ment, and early learning of new content. They also noted that the students were excited to be a part of something bigger than just physical education or just science.

Rairigh and Townsend (2001) asserted that quality integration relies on collaboration and communication between the classroom and physical education teachers. Because physical education teachers are not the experts in the content taught in various classrooms, they must collaborate with classroom teachers to provide ideas and resources. However, many physical education teachers report challenges with gaining the necessary cooperation from classroom teachers. With this in mind, the integration templates presented in this article are designed to be easy and time efficient for both the physical education and classroom teachers.

Integration Templates

The remainder of this article presents four integration templates that are designed to allow for the linking of any physical

education content with any classroom content. The term template is used purposefully in that the same template can be used to link dribbling with math, fitness with English language arts, striking with social studies, or even tumbling with science. The templates are also versatile in that they can be used as warm-ups, as reviews of previous knowledge (in either subject), or as focus of a complete lesson. The four templates have been named (1) *If-Then*, (2) *Knowledge Tag*, (3) *Out and Back*, and (4) *Dice Roll and Solve*.

If-Then

If-Then activities are an excellent means of getting a class moving quickly and integrating content without extensive explanation. The “If” part relates to the classroom content, whereas the “Then” is the physical education movement response. That is, depending of the content of the classroom content, students will perform one of two movement skills. Taking an example that connects math with basketball, *If* the teacher displays an odd number (on a card, with their fingers, or projected on the

wall), *then* the students bounce pass to a partner. *If* the teacher shows an even number, *then* the students chest pass to a partner. Table 1 has a number of examples that link different subjects with physical education content.

Knowledge Tag

Knowledge Tag games are a fun way to get students ready to move for the day. In these activities, students who are designated as taggers carry an index card with a classroom-related task written on the card. Another option is to put the index in a Ziploc bag taped to a short pool noodle. The student who gets tagged must correctly complete the task on the index card before resuming play. If the student does not complete the task correctly, they must seek another tagger to complete a new task correctly. Successful completion of tasks can result in the student being freed/unfrozen or the student becoming the tagger. Spelling words, math problems, state capitals, countries and their continents, shapes, formulas, and body parts are examples of content you can put on the index cards.

Table 1. Example If-Then Activities

Classroom Content	Grade Level	If...	Then...
English language arts	Fourth grade	The phrase is a simile	Do five jumping jacks
		The phrase is a metaphor	Do five standing lunges
	Sixth grade	The sentence uses the correct pronoun	Practice a crossover dribble
		The sentence uses an incorrect pronoun	Practice a between the legs dribble
Math	First grade	The two math problems are equal (e.g., $3 + 3 = 5 + 1$)	Jump and land off two feet
		The two math problems are unequal (e.g., $4 + 5 = 2 + 6$)	Hop and land off one foot
	Sixth grade	The equations are equal (e.g., $3y$ & $y + y + y$)	Practice a forehand strike with a tennis racket
		The equations are unequal (e.g., $5y + 2x$ & $2y + y + x + x$)	Practice a backhand strike with a tennis racket
Science	Third grade	The animal has scales	Dribble with your right hand
		The animal has fur	Dribble with your left hand
	Seventh grade	The statement describes prokaryotic cells	Demonstrate balancing skills by walking across a balance beam or line on the gym floor
		The statement describes eukaryotic cells	Demonstrate balancing skills by holding a one-legged pose for 30 seconds
Social studies	Kindergarten	The teacher names a good (e.g., food, toys, clothes)	Overhand throw the ball to your partner
		The teacher names a service (e.g., medical care, law enforcement, fire protection)	Underhand throw the ball to your partner
	Seventh grade	The teacher names a rural area	Demonstrate a basketball pass fake
		The teacher names an urban area	Demonstrate a basketball shot fake

Table 2. Example Out and Back Activities

Classroom Content	Grade Level	Physical Education Content	Task to Complete
English language arts	Fifth grade	Punt a football, and then retrieve the football and a card before returning to the start.	Cards contain either a vocabulary word or definition. Collect cards, and then match the words with their definitions.
	Seventh grade	Equally space out students on each team across the gym. Students pass the basketball down the court. The last student receives the pass, picks up a card, and then dribbles back to the start. Students follow their pass and rotate up one spot for subsequent turns.	Cards contain either a clause or a phrase. Collect cards, and then sort them into piles of clauses and phrases.
Math	Second grade	Locomotor movement (e.g., run, skip, gallop) to collect a playing card.	Collect enough cards to make a total score of 25.
	Sixth grade	Dribble down with dominant hand to collect a card. After collecting the card, dribble back with non-dominant hand.	Each card contains an integer (positive or negative). Collect cards, and then order the cards on a number line based on their relation to 0.
Science	Kindergarten	Run to collect a card.	Cards contain either living or nonliving things. Collect cards, and then sort them into piles of living and nonliving things.
	Eighth grade	Putt a golf ball. After making the putt, return to the start with a card.	Cards contain either the name or the symbol of elements on the periodic table. Match the names with the symbols.
Social studies	Second grade	Run to the hoop, do a designated number of rope jumps, and return with a card.	Each card contains a U.S. state. Collect cards, and then place the cards in pairs of neighboring states.
	Seventh grade	While facing the start, defensive slide at the angle determined by the teacher. The teacher has the students alternate between sliding left and right. Students pick up a card and run back to the start.	Each card contains a country. Collect cards, and then sort them into piles of each country's type of government (e.g., democracy, monarchy, dictatorship)

Out and Back

The integrated template of *Out and Back* is aimed to reinforce locomotor or ball skills with problem-solving tasks. For this activity, students are grouped into small teams consisting of three to five students. The object of the game is to perform a designated task to collect a card from the team pile. Each card collected contains content-specific information that contributes to a piece of an academic puzzle that each group of students will solve once all of the cards are collected. For example, each student in turn dribbles a ball with their feet to a designated hula-hoop holding cards that have parts of speech written on them. Then the students dribble the ball back to their teams, where there are four poly spots; each color representing a part of speech (blue = noun, green = verb, yellow = adjective, orange = adverb). The students place

their card on the poly spot (part of speech) that corresponds to the word on their card. Table 2 provides further examples.

Dice Roll and Solve

Dice Roll and Solve integrated activities provide instructors with class sizes ranging from small to large the opportunity to connect outside content areas with physical education, and it is fairly easy to instruct. For this type of activity, you will need two insertable or write-on foam die (these also can be made out of cardboard). One die has math challenges on it, while the other represents the movement tasks. Students roll the die, complete the content area challenge, and with that answer, participate in the rolled movement task. See Table 3 for example activities.

Table 3. Example Dice Roll and Solve Activities

Grade Level	Physical Education Content	Math Challenge
Kindergarten	Beginner jump rope skills (jump over a rope lying on the floor)	Count by tens from 1 to 100
First grade	Bouncing and catching a ball	Simple addition and subtraction (e.g., $4 + 5$, $14 - 7$)
Third grade	Overhand throwing with a partner	Determine the missing number in each equation to make it true (e.g., $8 \times ? = 48$, $? \div 3 = 5$)
Fourth grade	Jump rope skills	Multiplication or division word problems
Sixth grade	Basketball dribbling and shooting	Ratios (e.g., 3:1 — three dribbles for every one shot)
Eighth grade	Frisbee passes with a partner	Squares and square roots (e.g., 2^2 , $\sqrt{81}$, $3^2 + 2$)
Ninth–12th grade	Dynamic warm-up exercises	Use the Pythagorean Theorem to solve for the triangle's hypotenuse
Ninth–12th grade	Stretching	Roman numerals



© iStockphoto/skynesher

Conclusion

Research has shown that physical education teachers often feel as though their subject matter and themselves are marginalized within their schools (Lynn & Woods, 2010; O'Sullivan, 1989; Solmon, Worthy, & Carter, 1993; Stroot, Collier, O'Sullivan, & England, 1994; Woods & Lynn, 2001). The purpose of this article was to provide simple advocacy strategies that physical education teachers could use that show other teachers they are willing to help reinforce classroom content as a contribution to the school mission. The templates described (*If-Then, Knowledge Tag, Out and Back, and Dice Roll and Solve*) were designed so that no compromises are necessary to the physical education content while achieving these goals. While the authors have provided specific examples of activities within each category, they are not limited to just those activities. Indeed, almost any physical education and classroom content can be connected, with only imagination and creativity being the limits to the tasks that are designed.

References

- Ackerman, D. B. (1989). Intellectual and practical criteria for successful curriculum integration. In H. H. Jacobs (Ed.), *Interdisciplinary curriculum: Design and implementation* (pp. 25–38). Alexandria, VA: Association for Supervision and Curriculum Development.
- Derri, V., Kourteissis, T., Goti-Douma, E., & Kyrgiridis, P. (2010). Physical education and language integration: Effects on oral and written speech of pre-school children. *Physical Educator, 67*(4), 178–186.
- Eveland-Sayers, B. M., Farley, R. S., Fuller, D. K., Morgan, D. W., & Caputo, J. L. (2009). Physical fitness and academic achievement in elementary school children. *Journal of Physical Activity and Health, 6*(1), 99–104.
- Finkenbergh, M. E., & Fortes, S. (2003). Climbing the walls to write in physical education: A technology-integration project. *Journal of Physical Education, Recreation & Dance, 74*(8), 12–13.
- Gagen, L., & Getchell, N. (2008). Applying Newton's apple to elementary physical education: An interdisciplinary approach. *Journal of Physical Education, Recreation & Dance, 79*(8), 43–51.
- Hastie, P. A. (2013). The Biome Project: developing a legitimate parallel curriculum for physical education and life sciences. *Education 3-13, 41*(5), 462–476.
- Hollett, N., Sluder, J. B., Taunton, S., & Howard-Shaughnessy, C. (2016). Teaching body and spatial awareness in elementary physical education using integration of core content subjects. *Journal of Physical Education, Recreation & Dance, 87*(7), 31–35.
- Howard-Shaughnessy, C., & Sluder, J. B. (2015). Roller skating and interdisciplinary physical education. *Strategies, 28*(4), 26–32.
- Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership, 58*(3), 34–38.
- Lux, K. M. (2010). How to raise the status of physical education at your school. *Journal of Physical Education, Recreation & Dance, 81*(8), 40–56.
- Lynn, S. K., & Woods, A. M. (2010). Following the yellow brick road: A teacher's journey along the proverbial career path. *Journal of Teaching in Physical Education, 29*(1), 54–71.
- O'Sullivan, M. (1989). Failing gym is like failing lunch or recess: Two beginning teachers' struggle for legitimacy. *Journal of Teaching in Physical Education, 8*(3), 227–242.
- Rairigh, R. M., & Townsend, J. S. (2001). Moving beyond the why: How to integrate into physical education. *Teaching Elementary Physical Education, 12*(2), 34–37.
- Rovegno, I., & Gregg, M. (2007). Using folk dance and geography to teach interdisciplinary, multicultural subject matter: A school-based study. *Physical Education and Sport Pedagogy, 12*(3), 205–223.
- Solmon, M. A., Worthy, T., & Carter, J. A. (1993). The interaction of school context and role identity of first-year teachers. *Journal of Teaching in Physical Education, 12*(3), 313–328.
- Stroot, S. A., Collier, C., O'Sullivan, M., & England, K. (1994). Contextual hoops and hurdles: Workplace conditions in secondary physical education. *Journal of Teaching in Physical Education, 13*(4), 342–360.
- Wade, M. (2016). Math and movement: Practical ways to incorporate math into physical education. *Strategies, 29*(1), 10–15.
- Woods, A. M., & Lynn, S. K. (2001). Through the years: A longitudinal study of physical education teachers from a research-based preparation program. *Research Quarterly for Exercise and Sport, 72*(3), 219–231. 

Brenna Cosgrove (bmc0053@auburn.edu) is a PhD Candidate in the School of Kinesiology and Jessica Richards is a PhD Candidate in the School of Kinesiology at Auburn University in Auburn, AL.