Physical literacy, as defined by SHAPE America – Society of Health and Physical Educators (2015), is the primary goal of physical education. Physical education incorporates a variety of skills that students can apply in their working life. Through physical education, students develop leadership skills, teamwork, strategic thinking and abstract thinking. Physical educators can go even further in the lessons they teach by incorporating literacy and math skills. Teaching these skills is important because 32 million U.S. adults are illiterate (Coughlan, 2015). Physical education teachers do have time constraints; sometimes they are the most sought-after department in the school. They have lunchtime clubs and after-school activities, and do not have enough time in their days to fully plan the lessons they teach. However, physical education teachers can easily embed math and literacy concepts into their curriculum to enhance student learning across disciplines. This concept of mixing subjects is called cross-curricular integration (Jacobs, 1989). Usnick, Johnson and White (2003), Phillips and Marttinen (2013), Finn and McInnis (2014) and Kokko, Eronen and Sormunen (2015) found that cross-curricular integration is successful in an array of disciplines. Furthermore, findings have indicated that integration is feasible and improves students’ knowledge and inquiry skills. The author has also implemented cross-curricular strategies (even as a new teacher) and found that they folded right into her teaching practice once she became accustomed to it.
Table 1 includes a variety of strategies for integrating literacy and math into different content units that are often included in physical education. While this list is not exhaustive, it does provide examples of strategies related to cross-curricular integration. In a regular physical education lesson, there are various naturally occurring opportunities to integrate math, including statistics, scoring and distance measurements. Students can practice by writing answers on resource cards, worksheets or mini-whiteboards or by responding to math questions posted on the board.

Additionally, there are moments to capitalize on the development of verbal and written literacy. The most common element of literacy across all sports is the use of keywords: invasion, numerical overload, advantage, quadriceps, stride length, etc. These keywords can be included in a variety of lessons. For example, in a dance unit, the teacher could ask students to use their body parts to spell out a word with their team members. This activity really draws on students’ creativity. The word chosen can be fundamental to the learning objectives; for example, in this case, it would be motif or space. When all the students are in place, the teacher can also ask them for a definition. Resource cards are invaluable when teaching literacy; students read the card, which has task instructions on it, and then provide written answers.

More often than not, these tasks become routine for students and they enjoy doing them, especially if they are incorporated into a reward system. To check for understanding of a math question posed on the board, the teacher could stand at the door at the end of the class and have students whisper the answer as they exit. Students who are confident in their answer could leave first, those who are fairly certain could leave next and those who are uncertain could wait behind and check their answers with the teacher.

Furthermore, teachers can introduce aspects of information technology into their curricula. With the use of technology, they can film a dance with a flip-cam, and students can give self-feedback. Angles of soccer kicks could be worked out using applications such as the iPad app “Coach’s Eye.” Also, if a teacher wants students to create a table of results, it could be done using a computer program such as Microsoft Excel.

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Literacy</th>
<th>Math</th>
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<tbody>
<tr>
<td>Soccer</td>
<td>• Discuss formations: Draw a strategy on the whiteboard and explain it in full sentences to your team, while listening to others. Promote the use of “point, example, explanation.”&lt;br&gt;• End plenary: Ask students to write a mini-article that could potentially get published in the school newsletter on what happened in the game. <em>This could be given as an out-of-class assignment.</em></td>
<td>• Count how many shots on goal were successful.&lt;br&gt;• Count the number of successful passes.&lt;br&gt;• Count the number of corners that took place.&lt;br&gt;• Ask students to tally up the results and turn them into fractions and percentages.</td>
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<tr>
<td>Track and Field</td>
<td>• Focus on key muscles and bones used in an exercise: Spell out the word “quadriceps” and start skill-related practice or point to the muscle.&lt;br&gt;• Can be used as a whole-class activity after a warm-up in unison through pointing to different areas of the body. <em>Students with specific learning difficulties can have the opportunity to write answers or buddy up with a friend to collaborate with.</em></td>
<td>• In sprints or distance events, students can measure their distance and work out their average speed.&lt;br&gt;• Students can make comparisons between their own results and national/school averages in any event.&lt;br&gt;• Using any of the disciplines, students can work out the mode, mean, median and range of results.</td>
</tr>
<tr>
<td>Basketball and Volleyball</td>
<td>• Match keywords to definitions; for example: the picture of a dig or the definition of the dig to the matched word. This can be done actively by spreading your definitions around the court and asking students to find the one that matches “dig.”&lt;br&gt;• Learn of the names of the lines on a court in basketball (perfect for warmups): Ask students to run and stand in the D &gt; sideline &gt; free-throw line.</td>
<td>• Ask students to work out the square root of 25 and then get themselves in that number group (they should get into groups of five).&lt;br&gt;• With the use of a stopwatch, time the quarters and count how long is left in the last 30 seconds.&lt;br&gt;• Use the court lines: Students can work out the angles and use the shapes. The three-point line, including the end line, can be used to work out the diameter and circumference of a circle.</td>
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(continued)
It may seem daunting to implement cross-curricular integration in lessons, but it becomes easier when the tasks are introduced one at a time. Teachers have the opportunity to incorporate more than just skills and gameplay by delivering high-quality physical education that includes cross-curricular integration. Skills learned across disciplines help students build cognitive bridges between information they have learned and may increase retention (Usnick et al., 2003). A former student may be out shopping and come across a sale of 30% off the posted price. As they are working out the solution, they may remember it was their physical education teacher who helped them learn the arithmetic!

References


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Table 1. (Continued)

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<tr>
<th>Content Area</th>
<th>Literacy</th>
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| **Softball and Baseball** | • These sports are known for student waiting time during which writing can be used to enhance cognitive engagement: Write your team tactics/team score on a whiteboard; come up with three strategies you are going to use when fielding and then discuss these with your team.  
• Design a modified game-instruction resource card and ask students to read it and play the game, or ask the students to design the game and write the instructions. | • Discuss shapes that are on the field of play.  
• Measure angles of the shots hit, angles of the bases and perimeter, and area of the field of play.  
• Use comparison questions: If we know the area of a softball field is X and the area of a volleyball court is Y, which is larger? |
| **Dance and Gymnastics** | • When evaluating performance, use peer feedback: two strengths and an area of improvement in performance that students verbalize to others.  
• As a warm-up within student dance groups: If they are in groups of six, ask them to spell out “unison” or “cannon” with their bodies. This exercise increases student creativity and can be adapted easily by students randomly moving around the room and getting into other numbers of groups. | • Counts within a dance linked to time: Pose a question on the board; for example: If a piece of music is 3 minutes long and in 30 seconds you can do 15 moves, how many moves will you be able to do total? (Answer: 90)  
(Students are using mental math, addition, subtraction and multiplication depending on the question posed.) |

Submissions Welcome!

Readers are encouraged to send “Advocacy in Action” submissions to column editor K. Andrew R. Richards at advocacy@shapeamerica.org.

The purpose of the Strategies column “Advocacy in Action” is to provide tangible, real-world examples of grassroots and national-level advocacy activities taking place in the fields of physical education, health education and physical activity. Submissions should be written in a conversational, practical tone. Columns should be 1,000–1,300 words, or roughly four typed, double-spaced pages.