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Dance as a Road to Science

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One of the challenges facing the science community is finding ways of demonstrating for non-scientists the logic and appeal of understanding how science applies to familiar phenomena. Dance movement involves many examples of physical principles that allow dancers and observers of dance to deepen their understanding of the natural world. To demonstrate the connection between science and art, we will observe a ballet dancer performing several movements which we can then analyze to illustrate why the movements are shaped the way they are and how dancers can improve their effectiveness through such analysis. One example is the *tour jeté*, a half turn in the air during a vertical jump. The dancer's intent is to create the illusion of going up facing one direction, suddenly reversing direction while aloft, then landing. Good dancers recognize that they can most effectively create that illusion if they understand how the closeness of their legs determines their moment of inertia and hence rate of rotation. Another intriguing movement is a "whip turn," a partnered *pirouette* in which the woman's leg is used to store angular momentum while her partner continues to increase that momentum by applying forces to her waist. This storing of angular momentum in a leg is a principle also used in *fouetté* turns, a common repeated *pirouette* sequence. These examples, and others, many of which involve a broader range of motion than just rotation, provide the basis for observers and performers to understand how some dance movements can be carried out so effectively and beautifully!