

# The Uncontrollable Foot

## Teacher Information

### Materials:

- sheet of plain paper
- pencil or pen

### Procedure:

- 1) Each member of the group will take a turn.
- 2) Stand up at the table with the paper in front of you, holding the pencil in your hand.
- 3) Rotate the foot on the same side as your pencil (if you are right-handed, rotate your right foot, if left-handed, rotate your left foot). No matter which foot you are moving, you should be moving it clockwise, with the foot lightly touching the floor.
- 4) Keep your foot rotating while you write a large number 6 on your paper. Your group should be watching so see what is happening with your foot.
- 5) Now switch feet, and do steps 4 and 5 again, with the foot on the opposite side to your pencil rotating clockwise. Have your group observe what is happening.
- 6) Repeat steps 4 to 6 again, with your feet rotating in a counter-clockwise direction.

### Questions to answer:

- 1) Which of the four directions was the easiest to carry out?
- 2) When moving your foot in a clockwise direction and writing the number 6, was it easier with the left foot or the right?
- 3) Why is it difficult to rotate the foot on your dominant side (right foot if you are right-handed, left foot if you are left-handed) in a clockwise direction?
- 4) What part of the body controls muscle movements?
- 5) What would happen if you tried writing the number 6 with the opposite hand?

### Explanation:

The cerebellum is located at the base of the cerebrum in the human brain. The cerebellum controls the coordination of voluntary movements. It is important for such activities as walking, dancing, playing sports, or even for such routine tasks as tying a shoelace or writing a number 6.

Doctors have known for generations that nerve fibres from the right side of the body cross over in the brain stem to the left side of the brain. Similarly, nerve fibres from the left side of the body cross over to the right side of the brain. In other words, the whole left side of the body is controlled by the right half of the brain, and the right side of the body is controlled by the left side of the brain.

For a right-handed person, when writing a figure 6 with the right hand, the left half of the brain has instructed the right hand to make a counter-clockwise motion. The right foot can easily make a counter-clockwise motion at the same time, the opposite movement requires a special effort. The same is true of a left-handed person with their left foot.

Adapted from the activity:

**17.24 The Uncontrollable Foot**, page 454,  
Invitations to Science Inquiry, 2<sup>nd</sup> ed.,  
Tik L. Liem,  
Ginn Press, 1987

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### **Questions to answer:**

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- 4) What part of the body controls muscle movements?
- 5) What would happen if you tried writing the number 6 with the opposite (not your dominant) hand?

