Concept:
The audience will hear the buzzer’s stationary frequency shifted up as the ball moves toward them, and down as the ball moves away.

The shifted frequency is given by

\[ f' = \frac{v}{v \pm v_s} f, \]

where \( v = 343 \text{ m/s} \), \( \pm \) means source moves (+) away from or (−) toward the observer, and \( f = 4.0 \text{ kHz} \). With the ball moving at \( v_s \approx 5 \text{ m/s} \), the frequency shift, although no more than a few percent, is still clearly perceived.

Equipment:
1. Foam Ball
2. Buzzer (4 kHz)

Procedure:
1. Unzip ball, turn on buzzer, and re-zip ball.
2. Throw the ball a student located in the middle of the classroom.
3. Have that student throw the ball to another student.
4. Ask the students to report whether they heard a higher or lower frequency than when the ball was stationary.
5. Discuss the correlation between the motion/location of the ball and their reports of frequency changes.