Possible extensions to this lesson. All involve balance board experiments and can be performed by students on their classmates.

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| COM in the Population | COM of the body in the “anatomically neutral” position (at rest with arms at side) is generally slightly above the navel for males and below for females   * Measure COM in body’s anatomically neutral position, i.e., laying on back with arms resting at side. Normalize COM location to height of person and relate to anatomy, e.g., naval * Develop and test hypotheses about how COM location varies with body characteristics, e.g., height, build, and sex |
| Squat Form | Sitting or squatting is a common resting position for the body, and the form of the sit or squat varies across cultures.   * Measure COM location for shallow squat (knees slightly flexed), mid-range squat (thighs parallel to floor), and deep squat (thighs touching calf). * Compare COM location relative to anatomy in each case, specifically, where COM is located relative to the torso and to the feet. * Assess comfort and perceived stability of each squat for the test subject. Develop hypotheses of how COM location affects comfort and stability in various squat positions. |
| Crutching | Crutches are used to reduce weight bearing while walking – or ambulating - on an injured leg. Safe and effective ambulation keeps the body’s COM near the mid-point of the body, i.e., in line with the naval.   * Measure COM location while standing with crutches. Experiment with one vs. two crutches and fully vs. partially offloading the “injured” leg. * Develop and test hypotheses about which crutching configuration, e.g., one crutch with full offloading, is most and least balanced and efficient by comparing COM location while crutching to the body’s mid-line |