Could You Please Stand Still?!!!
Activity 2F

Activity Overview

Objectives:

Using a home-made "stabilometer", students will be able to:

- Perform four assessments of balance and sway.
- Analyze data collected to describe how sway and balance are inter-related.
- Collect and organize data, transfer data to the correct type of graph and draw conclusions based upon the data.
- Estimate the area of an irregularly-shaped graph.

Activity Description:

Students will investigate the inter-relationship between sway and balance by performing four assessments using an easily-created stabilometer. Working in groups of four, students will each take an active role in making four ***stabilograms***. The group will then ***estimate the area*** of the stabilogram using a ***Unit Square Grid***. Working together, the group will ***create graphs*** of the estimated area of each stabilogram. From these graphs, students will ***draw conclusions*** about the relationship that exists between ***sway and balance***. ***Student Task Cards*** are included in the activity pages to help students clearly define their roles and to stay on task during the activity.

Activity Background:

A person's ***stability***, or standing balance, is determined by their ability to achieve equilibrium between many different muscle and sensory systems. Pressure changes in the feet and lower extremities cause us to shift our weight, creating ***sway***, in order to compensate for these changes. ***Sway*** and ***balance*** are inter-related. As ***balance*** decreases, ***sway*** increases, making ***sway*** one of the most reliable ways to determine a person's risk of falling. Other factors have also been proven to affect ***sway*** such as having to perform cognitive tasks (Stoop test), having a visual impairment, having neuropathy or possessing a physical disability. Aging can also affect ***sway*** and ***balance***. Elderly people are less responsive to touch, making it more difficult to compensate for these changes and putting them at a greater risk for falls. Variations in ***sway*** due to simple variables will be the central focus of this lesson.

Activity Materials: (per group)

- Stabilometer*
- Bicycle helmet with slot or hole in crown
- Vis-à-vis marker
- 4 sheets of graphing paper, 1/2" grid
- Meter stick
- Doorway

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- One copy of the **Task Card** set (4 cards)
- 1 Copy ***Student Data Page*** (per student)

* Instructions for assembling a Stabilometer are included in these ***Teacher Information Pages***.

Activity Management Suggestions:

Be sure to explain to students that they must not change task cards during the four assessments. In order to make a "fair" comparison between the assessments, as many variables as possible must be controlled. Changing the ***"Balancer"*** would make a "fair" comparison impossible.

Copy the ***Unit Square Grid*** onto a transparency for student groups to use.

For students needing more assistance: Allow these students to work with a peer tutor and assist them in the collection of data and transferring data into graphs.

For highly able students: Allow these students to work independently if they choose and allow them to work on the extension activity.

Extension/Modifications:

Inquiry: Allow students to conduct their own research on stability and sway using an Internet search engine. Students may also move on to the ***Could You Please Stand Still Again?!!! (Stability Inquiry activity)*** to further examine the effect of different variables on sway and balance

For more information on stability and sway, consult the references cited below.

References Used:

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Roghind, H, et. al. (2003). Postural Sway in normal subjects aged 20-70 years. *Clinical Physiology and Functional Imaging,* 23(3), 171.

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