Walk/Run Earthquake Location

Group Materials

- 2 stop watches or other timers
- Masking tape
- 50 m measuring tape
- Access to "Earthquake" at http://www.sciencecourseware.com/virtualearthquake/

Instructions

Perform this activity in groups of three.

1. With the masking tape, mark 2 m intervals along a straight path for 50 m.
2. Two students will start walking together at point zero, one person will walk naturally and the other will "heel-toe" walk along the path. Both walkers should try to maintain constant speeds.
3. Each walker should keep the clock running in between markers and call out the time at each marker for the third person to record.
4. Repeat the time trial at least 3 times and find the average for your results.
5. Plot a *Distance versus Time* graph of your results. Use a suitable scale to fit both walkers' results on one graph. Draw a best-fit line for both people and calculate their ***average velocity*** in suitable units. (Remember that: average velocity = total distance travelled/time taken)
6. Calculate the difference between the time (t_1-t_2) for the two people to reach each distance, i.e. the "***time lag***."
7. Plot another graph of *Time Lag versus Distance* and draw a best-fit line to the data points.

Now, before proceeding complete the "Epicentre and Magnitude" section of the online module "Earthquake" at: http://www.sciencecourseware.com/virtualearthquake. Answer the online assessment and print your completion certificate. Start at "Execute Virtual Earthquake" near the bottom of the page.

Discussion

For the Walk/Run Activity:

a) Which of your graphs should go through the origin?
b) How would the *Time-Lag versus Distance* graph change if the person walking were to run at a constant average velocity?
c) What would be the effect on each graph of one person changing their speed during the test?
d) What happens to the S-P gap as the distance increases?