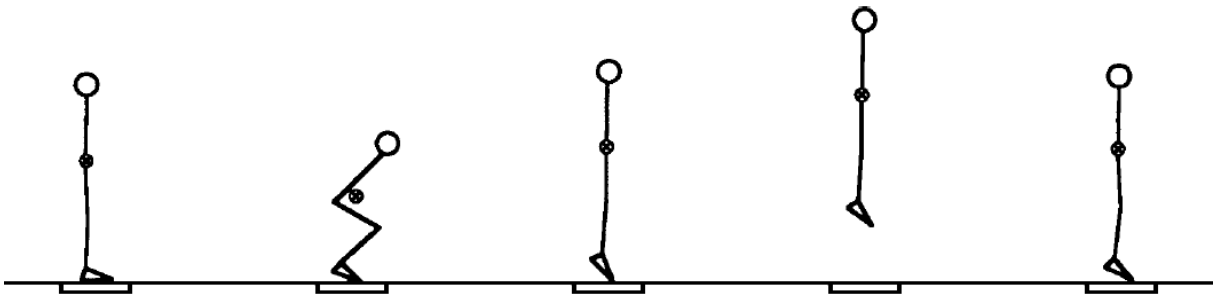

(Linthorne, 2001)

Vertical Jump Height Worksheet

A maximum vertical jump (or a Sargent jump), is a standard test for measuring the power output of an athlete. There are many ways to measure this height, so today we are going to be using accelerometers to measure it through the 'time of flight' and 'double integration' methods.

Time of Flight Method

If you were to jump straight upwards, the length of time you are in the air can determine how high you have jumped.

Activity: Jump 3 times and get 3 people to time you. Record the results below.

Find the average time, and then use the height formula to predict how high you jumped.

$$h = \frac{100g \times t^2}{8}$$

$$h = 125 \times t^2$$

	Jump 1	Jump 2	Jump 3
Timer 1 (s)			
Timer 2 (s)			
Timer 3 (s)			
Average time (s)			
My height prediction (cm)			
Height (cm)			
IMU's prediction (cm)			

Double Integration Method

You can also transform acceleration data into distance and find how high you have jumped.

~~This method is called double integration.~~

Acceleration

↓

Velocity

↓

Displacement

What is acceleration?

_____

_____

_____

What is velocity?

_____

_____

_____

What is displacement?

_____

_____

_____

What does the IMU predict the height of my jump is?

_____

Linthorne, N. P. (2001). Analysis of standing vertical jumps using a force platform. *Am. J. Phys., 69*(11), 1198-1204.