



Demonstrator # 6

GYMNASTIC-TRAMPOLINE

TEACHER NOTES

Activity title:

Gymnastics, trampoline discipline

Subject:

Sport Didactics, Gymnastics, Physical Education Teacher Training Programme, 4th semester of

Student age:

>19

Estimated duration:

2 X 60 minutes

Science content

General Information

acceleration - the rate of change of velocity over time (average acceleration = AV/At)

delta - the change in or difference between (symbol is Δ)

displacement - a change in position; $\Delta d = d_2 - d_1$

energy - the ability to do work

force - that which produces or prevents motion; that which can impose a change of velocity on a material

gravitational acceleration 9.8 m/s^2 , or 32 ft/s^2 , or 980 cm/s^2

gravity - that attractive force existing between all objects in the Universe

inertia - the reluctance of all matter to change its state of rest or uniform motion; the tendency of all objects to preserve its motion

kinetic energy - work done by a force along a given displacement; the energy involved in motion

mass - a measure of the inertia of that object; the greater the resistance something offers to being set in motion the greater its mass. The amount of matter being a definition for mass is a poor one.

motion - a continuing change of place or position

potential energy - stored energy due to composition, position, or condition

power - work divided by time; time required to exert force over a distance

scalar quantities - quantities involving only a given magnitude (examples: temperature, time, mass)

uniform motion - moving in a straight line at a constant speed

vector quantities - quantities which require both a magnitude and a given direction (for a complete description, examples: displacement, velocity, force, acceleration)

velocity - the rate of change of displacement over time; the ratio of motion in a particular direction; the distance travelled divided by the time taken (average velocity = $\Delta d/\Delta t$)

Learning objectives

To be able to explain how acceleration parameter and other derivate parameters are related to neuro muscular control and how understanding could improve learning strategies for qualitative moments in trampoline jumps.

Inquiry-based character

Stage 1: Work in pair or in small groups of 2-4 students.

If possible divide the group into subgroups which include at least one expert and one non-expert (Students take the role of master and apprentice)

Chose an action/movement to video record in stage 3 in an expert and non-expert jumper e.g. a pre-run and jump flip (Salto/roll)

Definition of phase 1 start and finish time ($T_2 - T_1 = \Delta T$) of the pre-run phase.

Definition of phase 2 start and finish time ($T_2 - T_1 = \Delta T$) of the jump phase (take off- landing).

Search for video clips and pictures on Internet and on the open source links given by the teacher. Study expert movements and discuss different strategies to reach the height, speed and acceleration. Define the lowest common denominator in the movement that contributes to a good technique.

Discuss the pros and cons of studying the movements from a technical perspective and do a simple SWOT analysis for the use of accelerometers in teaching trampoline.

Open Learning Resources

www.gymnastik.se

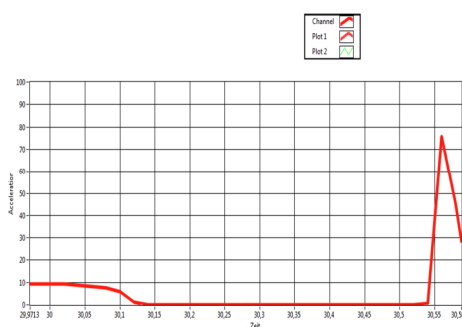
<http://www.eurogym.dk/index.php?id=130>

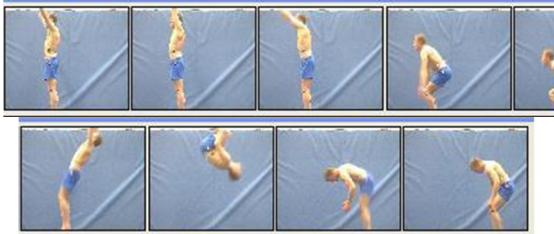
<http://www.gymfacts.ch/custom/search/index.php?action=search> (search on www.gymfacts.ch)

<http://www.netgymnast.dk/video.asp?id=4428>

<http://www.flickis.se>

www.youtube.com



<p>Stage 2 Develop hypothesis i.e. is there any difference at phase 1 and 2 in the below parameters?</p> <ol style="list-style-type: none"> i. ΔT ii. Average/peak velocity iii. Vertical displacement 	
<p>Stage 3 Apply the sensors at the wrist, ankle and body sensor. Integrity checks of sensor measurement: execute pre run and jump-flip-jump.</p>	
<p>Stage 4 Evaluate the evidence, compare the estimated calculations of the two actions executed by the expert and non-expert jumper. Pay particular attention to the original hypotheses and describe the various stages on the graph that has been downloaded from the sensors. Particularly describe what parameters most change between the expert and non-expert jumper.</p>	
<p>Stage 5 Final evaluation</p>	

Applied technology (if any)

Digital video camera (digital camera with video or mobile with video camera)

Materials needed

- **1 Personal Computer with Internet Connection**
- **InLot tools,**
- **Setting: 10m track, trampoline, mat, video camera,**

Discussion guide

Type of Learning: Inquiry based learning utilising a Collaborative structure with Problem Solving activities

Activity: Collaborative and pair

Learning Sequence: Define, explore, discuss, explore, discuss and redefine

Establishing a common understanding- Students are organised into groups and the methodology of master and apprentice is used.

The experiment- Experts and Non experts are working together (role based or real) to communicate and discuss two complex questions in order to understand and explain how acceleration parameters are related to neuro muscular control and how learning strategies may improve qualitative moments in trampoline jumps.

Conclusion, assessment and evaluation- Each group should present their result findings within a simple SWOT analysis, where their future professional role as PE teachers should be put in forefront. That is bridging didactics, pedagogy and physiology together.

Assessment

Presentation of the SWOT Analysis.

STUDENT WORKSHEET

Activity title:

Introduction

states a driving (research) question and outlines objectives

Thinking about the question

if needed provides information about the science addressed

Materials needed

if needed provides list of materials

Safety

The execution of the following experiment need to be supervised by a gymnastic teacher.

Investigation

Depending on the type of inquiry involved provides guidance on how to carry out the investigation

Analysis (SWOT)

If needed suggests analysis that can help interpret data

Further investigation

If needed provides suggestions for a next possible investigation or additional, deeper investigations

Assessment

If needed includes student assessment