



Demonstrator # 21

Motion and rest

TEACHER NOTES

Activity title:

Motion and rest

Theme:

Study of motion

Student age:

15 years

Time:

100 min

Scientific content

gives needed science background (concepts, definitions, laws etc) including pre-requisite knowledge required and science concepts developed in the activity, includes relevant students' difficulties,

Concepts: speed, graphic representation, dependent variable/independent variable,
Elementary and basic skills: observation, identification of variables, practice graphic representation, registration and use of registered data

Learning Objectives

At the end of the lesson the pupils will be able to :

- ⇒ interpret the graphic of acceleration as a function of time;
- ⇒ recognise different types of motion from the specific registered graphic;
- ⇒ measure and determine different motion' parameters;
- ⇒ exercise critical thinking skills by approaching the study of motion in different imposed conditions;
- ⇒ use accurately the scientific language;
- ⇒ compare different motions.

Inquiry based character of activity

highlights the IBSE character of the activity, specifies a type of inquiry and lists inquiry-based skills (for details, definitions and terminology to use see 'Short guide for designing inquiry-based teaching materials')

Guided Investigation; Blended Investigation

Teacher guided discovery

Applied Technology (if necessary)

Material necessary

- **materials:** mechanical school kit, sensors, soft
- **time:** 100 min

Methodological Guide

describes method, student learning activities (discussions, investigations, data analysis, reflections etc.) and leading questions, includes a suggested time outline

Anticipation

- ▣ **Examples of contextual situated problems** - pretext
- ▣ **Observation of short film** sequences selected by the teacher

Building Knowledge

Cube: Pupils are organized in 6 groups; each group receive a different task as follows:

1. describe what you observed in film sequences,
2. exemplify other similar situations with what they observed in film,
3. analyze each situation
4. represent graphically the speed versus time, associating the graphic with the observed motion in the film,
5. represent graphically the coordinate versus the time, associating the graphic with the observed motion in film,
6. argument.

- ▣ The teacher monitor the groups' activity and guide, offer points of support, sustaine the pupils in their investigations.

Reflectie/Consolidare

- ▣ **Assessment Method:** classroom map, observation
- ▣ **Evaluation Instrument:** written ending sheet

Alternate ending: If the interpretation of experimental data obtained by means of experimental measurements with the accelerometers can not be done in the classroom learning activities in time, the pupils will elaborate, as homework, written referate in which they will work with these data.

Assessment

provides suggestions how to asses the activity, preferable with concrete questions and expected student answers

- ✓ Compare two graphics of the motion in the case of speed running test at sport class
- ✓ Graphic modelling of the real contest motions
- ✓ Oral, conversation
- ✓ Written ending sheet



STUDENT WORKSHEET

Activity title:

Study of motion

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
mechanical school kit, sensors, soft

Safety

If needed lists warnings and cautions concerning the investigation

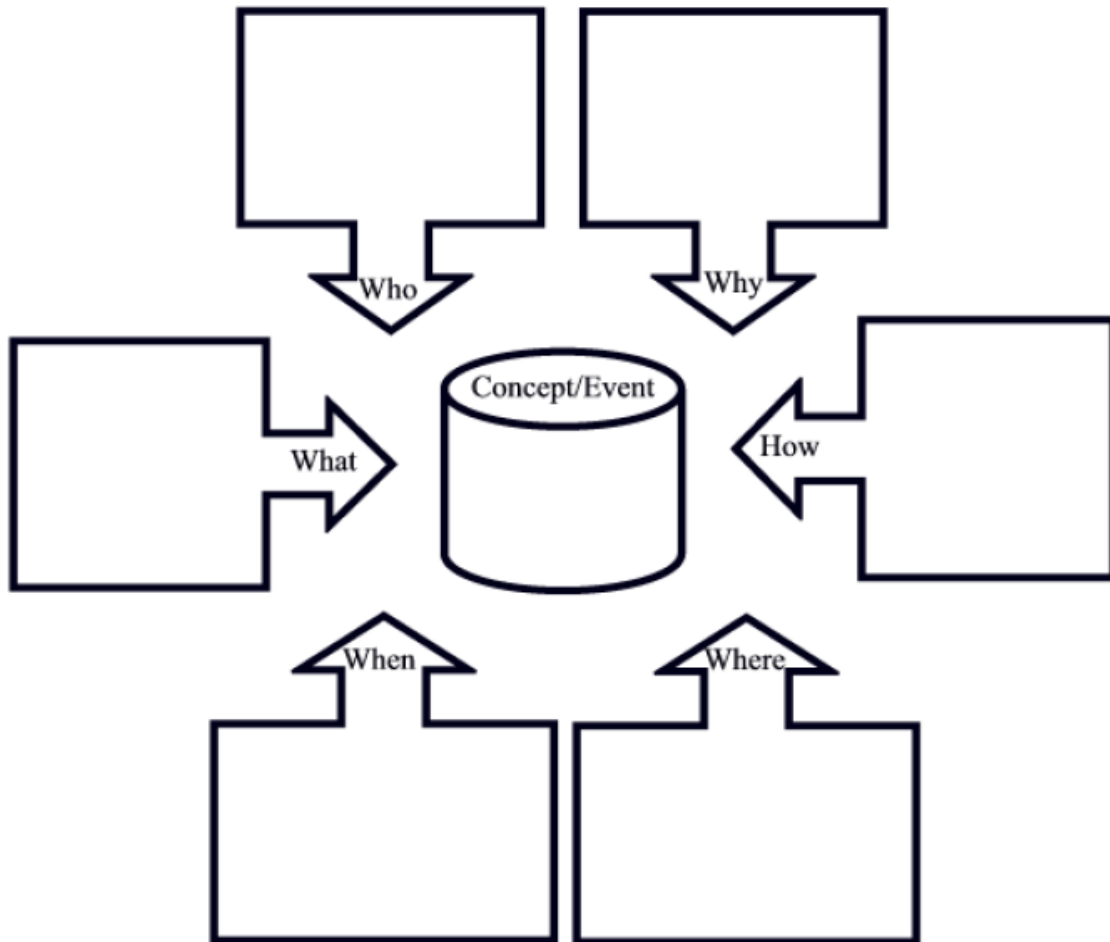
Investigation

Depending on the type of inquiry involved provides guidance on how to carry out the investigation
Pupils organized in groups realize the experiment /experiments proposed with the system of accelerometers

Analysis

If needed suggests analysis that can help interpret data

Concept Map:



Further investigation

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

Assessment

If needed includes student assessment