

Contents of The Physics Box

(A list of the case study, power point files in the Physics Box)

Amaze Your Mates.ppt

This case study is simply a collection of off-beat puzzles and activities:

ACTIVITY: Weaklings Revenge

ACTIVITY: A Knotty Problem

DEMO: A Mind reading act

QUIZ: Cable around the Earth

ACTIVITY: Hole in the Hand

ACTIVITY: Subtle Bomb Drop

QUIZ: Coin Pyramid

VIDEO CLIP: Tablecloth Pull

ACTIVITY: A Strange Plane - The Hoopster

ACTIVITY: Straw Flutes

ACTIVITY: Sound of the Sea

QUIZ: The Case of the Shiney Spoon

ACTIVITY: Hammer and ruler puzzle

ACTIVITY: Best Physics Experiment Ever - Microwave Oven

QUIZ: Hollywood Blockbuster Physics

FINAL THOUGHTS: A few websites for simple builds and amateur science

Balls in Flight.ppt

'Roulette Scam'

(Guardian article)

Mechanics and elastic/inelastic collisions

VIDEO CLIP: Dropping a hammer and feather on the Moon – Apollo 15

Coefficient of restitution, $e = 0$ for a cow pat!

Kinetic and potential energy gives e as function of initial and rebound heights

ACTIVITY: get them to measure bounces (and e) of different types of ball

APPLICATION: number of slides to show how Lawn Tennis Association use these same simple techniques to assess balls and also ball-turf interactions.

THOUGHT EXPERIMENT: Perpetual Motion Machines – what if $e > 1$? Show Cartoon of perpetual motion machine. Do they think it would work!?

DRAMATIC DEMONSTRATION: The pesky ping-pong ball! Care needed!

Set of slides to explain mathematically the rebound phenomenon

[At this stage they could try the demonstration out for themselves]

Centre of Mass and motion in a gravitational field: three equations given

Compute the time taken for a ball to drop to the floor from height, h

ACTIVITY: Measure your reaction time

QUIZ: Hanging in the air – footballers

IMPROBABLE RESEARCH: Flea Jumping

CHALLENGE: The Subtle Bomb Drop

QUIZ: The tumbling telescope

QUIZ: Fight flabbiness with physics

QUIZ: Flower power – fastest plant seed ejection

(Guardian article)

FINAL VIDEO CLIP: Stick motion beats gravity

Similar overviews for each of the following power point files can be found in the '**Overview of the power point files.doc**':

Become an amateur scientist.ppt

Communication and Coding.ppt

Defying Gravity.ppt

Electrons in Motion.ppt

Kitchen Physics.ppt

Magnetism and Magnetic Devices.ppt

Natural Disasters.ppt

Natural Sounds.ppt

Our Natural Environment.ppt

Physics - a sideways view.ppt

Physics Tricks and Optical Illusions.ppt

Quest for Invisibility.ppt

Relativity & Reference Frames.ppt

Renewable Energy Resources.ppt

The Doppler Effect.ppt

The Radio Universe.ppt

and also,

Quiz Questions I.ppt (This file contains 75 single page questions)
(See the Word file '**List of All Quiz Questions.doc**' for the titles and also the answers, which include any necessary mathematics).

Quiz Questions II.ppt (This file contains 50 single page questions)
(See the Word file '**List of All Quiz Questions.doc**' for the titles and also the answers, which include any necessary mathematics).

Quiz Questions III.ppt (This file contains 25 single page questions)
(See the Word file '**List of All Quiz Questions.doc**' for the titles and also the answers, which include any necessary mathematics).

