Classical Background

Experiments

Energy Diagrams I
Energy Diagrams II
Classical Probability

Equipment List

Energy Diagrams I

For each group of students:

1 Hot Wheels style car
1 meter plastic track for the car
1 short bar magnet to mount on top of the car
4 ceramic magnets with poles on the faces
4 L-shaped brackets

Sources
Toy stores and hardware stores.

Instructions
The ceramic magnets will stay on the L-shaped brackets. The brackets must be held in place so they will not move. Three options are possible:

1. Tape the brackets to the table.
2. Place a thin steel sheet on the table and thin ceramic magnets on 1/2 of the "L." The track sits on top of the sheet.
3. Place carpeting on the table and a strip of the hook part of Velcro on 1/2 of the "L." The track sits on top of the carpet.

The bar magnet must be attached to the roo of the car by tape or Velcro.

See Figure 4 in the InGagement for the arrangement of equipment

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Energy Diagrams II

For each group of students:

1 - low friction track or air track
1 - car or glider for above
2 - springs to connect the glider or cart to the ends of the track
2 - pieces of soft foam to attach to the bumpers at the end of the track
1 - computerized data acquisition system with a force probe and range finder

See Figures 3 through 6 in this InGagement for the arrangements used with this equipment.

Classical Probability

For classroom demonstration on setup, as shown in Figure 2, a low friction track, cart or glider and two springs is useful.

For each group, video analysis software such as VideoPoint or VidShell is needed. VideoPoint is available from Pasco (http://www2.pasco.com/products/scripts/products.taf?function=allproducts&catsection=Software). VidShell can be downloaded at no charge from http://webphysics.tec.nh.us/vidshell/clips.html.

References

Energy Diagrams I

Beiser, 1995 - Chapter 5
Blatt, 1992 - Chapter 7
Harris, 1998 -
Krane, 1996 - Chapter 5
More, 1998 - Chapter 8
Rohlf, 1994 - Chapter 7
Sandin, 1989 - Chapters 14 & 15
Serway et al., 1997 - Chapter 5
Thornton & Rex, 2000 - Chapter 6
Tipler & Llewellyn, 1999 - Chapter 6

Energy Diagrams II

Beiser, 1995 - Chapter 5
Blatt, 1992 - Chapter 7
Harris, 1998 - Chapters 4.4 and 4.5
Krane, 1996 - Chapter 5
More, 1998 - Chapter 8
Rohlf, 1994 - Chapter 7
Sandin, 1989 - Chapters 14 & 15
Serway et al., 1997 - Chapter 5
Thornton & Rex, 2000 - Chapter 6
Tipler & Llewellyn, 1999 - Chapter 6

Classical Probability

Beiser, 1995 - Chapter 3.2
Blatt, 1992 - Chapter 7.4
Harris, 1998 - Chapter 3.3
Krane, 1996 - Chapter 5.3
More, 1998 - Q7.5
Rohlf, 1994 - Chapter 5.3, Appendix D
Sandin, 1989 -
Serway et al., 1997 - Chapter 5.1
Thornton & Rex, 2000 - Chapter 5.6
Tipler & Llewellyn, 1999 - Chapter 6