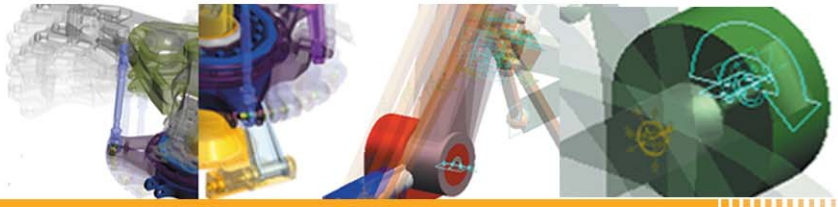
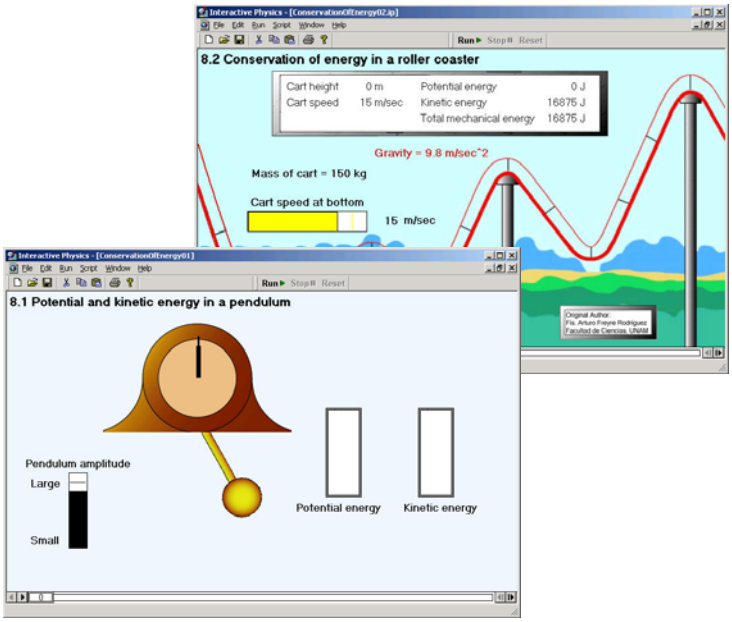
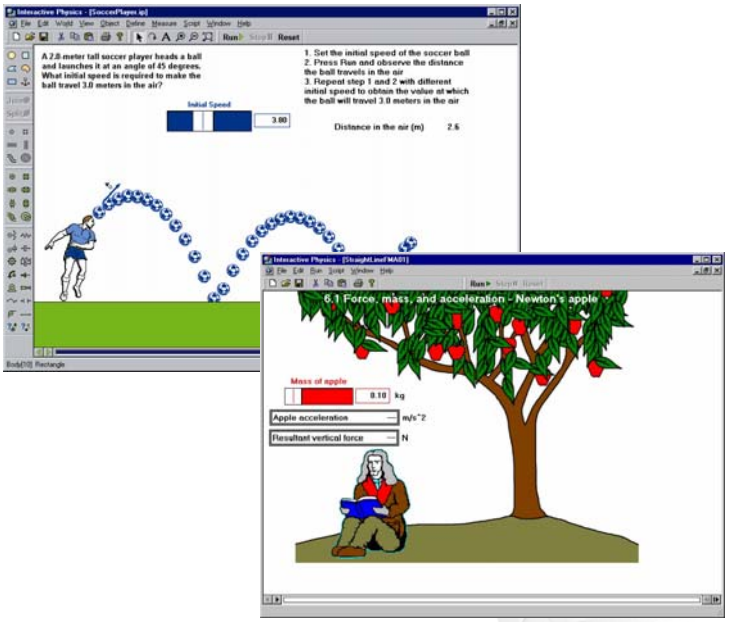
Design Simulation Technologies



Interactive Physics

THE WORLDWIDE STANDARD IN PHYSICS SIMULATION SOFTWARE





BOOST YOUR PHYSICS CURRICULUM WITH POWERFUL MOTION SIMULATION TECHNOLOGY

The foundations of scientific discovery are imagination and inquisitive “what if” curiosity. Interactive Physics makes your students active learners and empowers them to:

- Explore their physical world through fast-paced exciting simulation
- Visualize the abstract scientific concepts taught in the classroom
- Test hypotheses and investigate “what if” scenarios
- Learn school-to-career job skills with real-world motion tools

Adopted by more than 18,000 schools worldwide, try Interactive Physics and see why it has been named the “Best Educational Software Product” several years running.

EASY AND FUN TO USE! WATCH PHYSICS IN ACTION!

Create new experiments or interact with pre-designed Physics exercises to:

- Measure velocity, acceleration, force, momentum, energy, etc., in metric or English units
- Create ropes, springs, dampers, pulleys, slot joints, linear actuators, and rotational motors
- Hear and measure sound volumes, sound frequencies, and Doppler effects
- Vary air resistance, gravity, or material properties
- Create visually appealing presentations by attaching graphics to objects
- View results as numbers, graphs, and animated vectors

Encourage hands-on, minds-on, and can-do attitude in the classroom.

www.interactivephysics.com

EASY CURRICULUM INTEGRATION

Interactive Physics allows students to master concepts in a safe environment, without costly lab supplies and time-consuming lab setup. Your physics lectures and lab activities will immediately benefit from Interactive Physics!

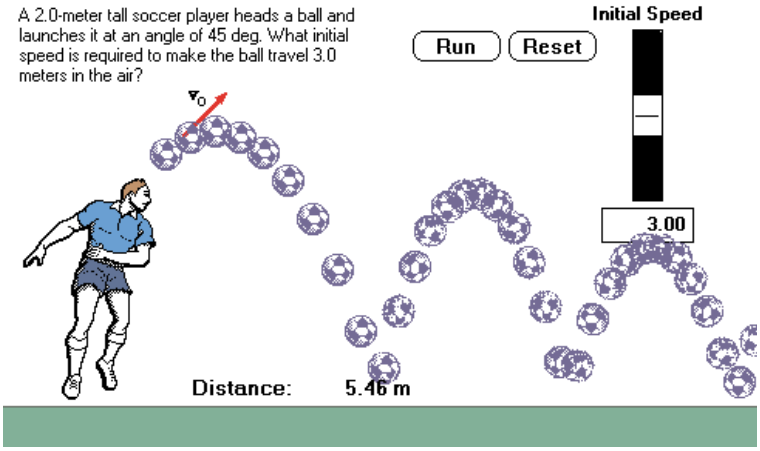
- Select from a wide range of ready-to run exercises built for your curriculum
- Rapidly customize existing models to meet your specific needs
- Create and share models with teachers and students
- Compare simulation data with theoretical results
- Demonstrate hard-to-explain concepts like Coriolis acceleration
- Show properties of objects that you cannot see in a lab, for example, vectors or the path of a body

COMPLETE CURRICULUM SUPPORT

- Offers both high school and college level ancillary support, with supplementary exercises, and activities for easy lesson planning and grading
- Widely adopted by major textbooks
- Complements textbook problems
- Excellent in-class demonstrations
- The Interactive Physics Homework Edition allows students to work at home and exchange assignments electronically with teachers and other students

REAL LIFE APPLICATION

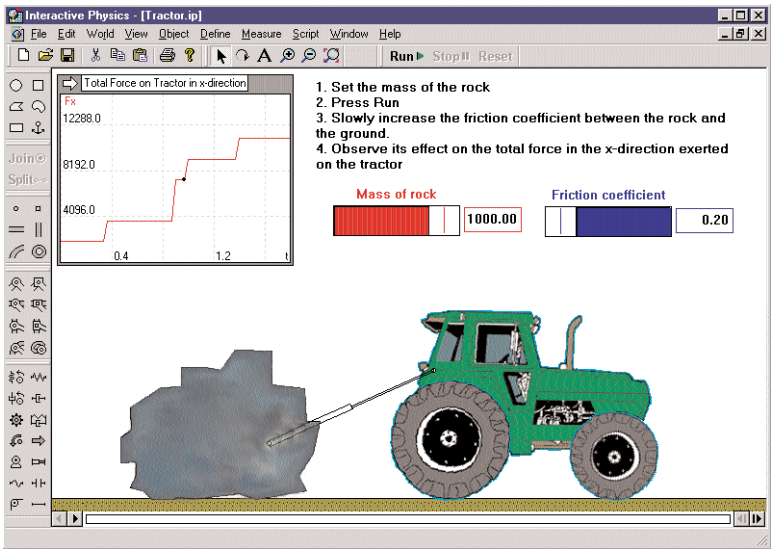
Design Simulation Technologies also develops Working Model for professional scientists and engineers. Check out www.workingmodel.com and see the same, professional motion simulation technology your students learn with Interactive Physics!



CORRELATED WITH NATIONAL EDUCATION STANDARDS

Your students master science objectives by creating simulations in essential physics topics, including:

1-D motion	Magnetics
2-D motion	Momentum
Collisions	Newton's Law
Conservation Laws	Oscillations
Doppler effects	Particle Dynamics
Electrostatics	Planar Motion
Equilibrium	Projectiles
Evaporation	Pulley Systems
Frequency	Rockets
Friction	Rotational Dynamics
Gears	Sound Intensities
Gravitation	Statics
Kinematics	Waves
Kinetic Theory of Gas	Trig Functions
Machines	Work and Energy



SYSTEM REQUIREMENTS

Windows Systems

- Microsoft Windows 95/98/ME/2000/XP/Vista/Windows 7
- 1 GB RAM minimum
- 60 MB disk space
- CD-ROM drive
- Sounds card for sound experiments

Design Simulation Technologies
43311 Joy Road, #237
Canton, MI 48187
USA
www.design-simulation.com
sales@design-simulation.com

Design Simulation Technologies

Help your students make the right moves toward their FUTURE!

Welcome to Interactive Physics

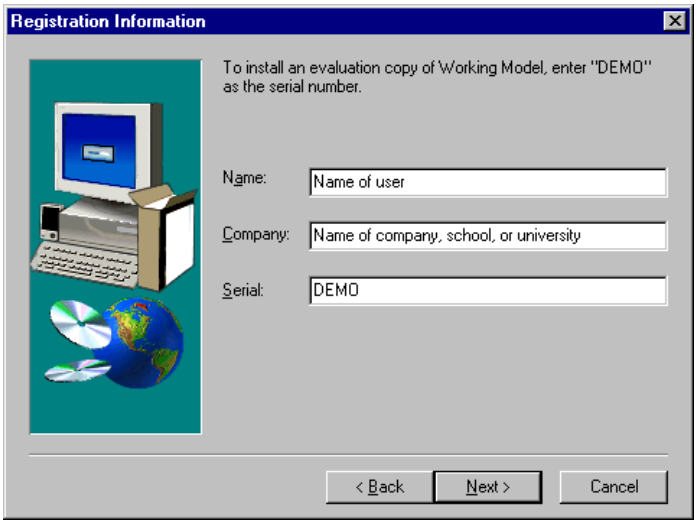
Interactive Physics is the result of a 15-year collaborative effort between physics instructors and software engineers. It is correlated with National Education Curriculum Standards and it teaches your students the same motion tools used by professional scientists and engineers. We are confident that Interactive Physics is a valuable tool for your classroom and laboratory.

To begin, install Interactive Physics and go through each step of the demonstration described below.

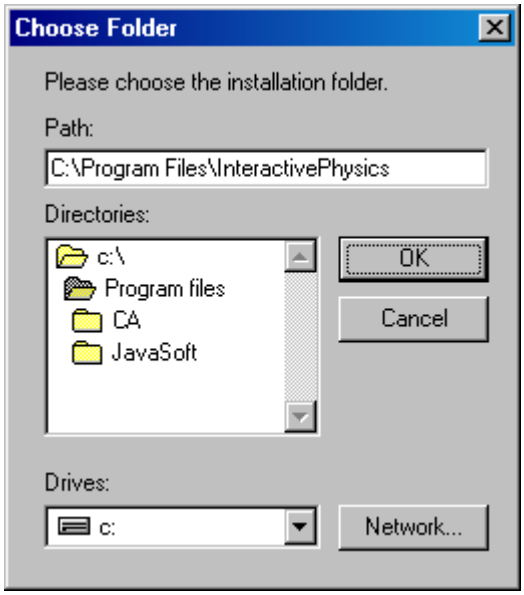
Step	Related Physics Concepts
1. Creating a falling block	Mass; freely falling objects; laws of motion; linear kinematics
2. Adding a velocity vector	Vector and scalar quantities; vector components; unit vector
3. Making a pendulum	Oscillatory motion; frequency and amplitude; rotational kinematics; centripetal force
4. Graphing the pendulum's motion	Graphs and measurements; motion diagrams
5. Changing gravity	Law of gravity; Newton's second law
6. Adding air resistance	Air resistance; non-conservative forces
7. Adding a spring	Spring oscillation; conservative forces; conservation of energy; kinetic and potential energy
8. Controlling the spring constant	Spring constant; natural spring length; equilibrium spring length
9. Collisions with a circle	Collision; elasticity; frictional forces; impulse and momentum
10. Attaching a picture to an object	Attaching pictures makes physics experiments realistic and fun
11. Adding sound	Sound waves; speed of sound; Doppler effect; sound frequency and intensity
12. Adding a curved slot joint	Roller coaster physics; motion in two dimensions; conservation of energy and momentum
13. Adding a force	Concept of force; Newton's first law; work and energy
14. Running demo files	Interactive Physics allows you to explore other essential physics topics, including: electrostatics, evaporation and condensation, gears, kinetic theory of gas, machines, magnetism, particle dynamics, projectiles and rockets, pulleys, rotational dynamics, static equilibrium, superposition of waves, and many more.
15. **Curriculum workbook**	Correlated with National and State Standards and Objectives, new interactive experiments explore speed, distance, time, acceleration, force, weight, mass, gravity, and air resistance

Installing Interactive Physics

Windows users:
1. Insert the Interactive Physics CD into the CD-Rom drive and follow the installation instructions
2. When prompted for a serial number, enter "**DEMO**" or enter your licensed serial number
3. When the "Choose Folder" window appears, click [OK].
4. For a step-by-step introductory tutorial, turn to the next page.



Mac users:
1. Insert the Interactive Physics CD into the CD-Rom drive. Double-click on the InteractivePhysics CD-icon
2. Double-click on the DoubleClickToInstall icon in the interactivePhysics window. Follow the installation instructions
3. For a step-by-step introductory tutorial, turn to the next page.



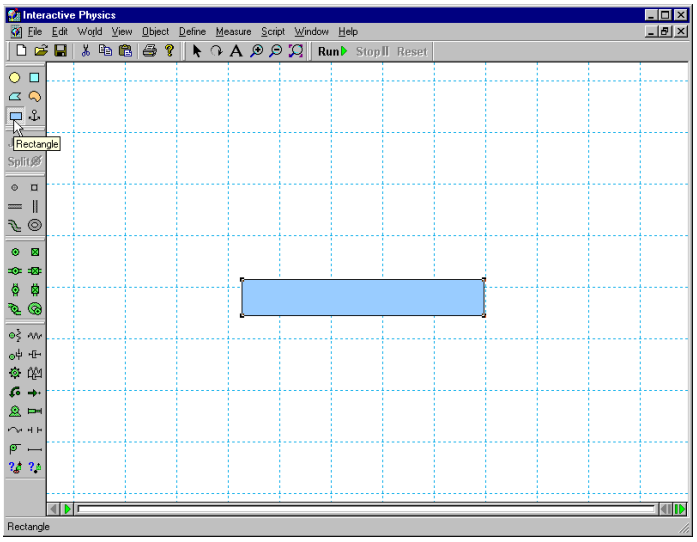
http://www.interactivephysics.com

Starting Interactive Physics

1. Ensure that Interactive Physics is installed on your computer.
2. From the Windows Start menu, click on Programs and then InteractivePhysics and then InteractivePhysics. This opens a new experiment.

1 Creating a Falling Block

1. The first simulation is Newton's first experiment, dropping a block.
2. To draw a rectangle, click on the Rectangle tool, then click in the workspace and draw a long thin rectangular block.
3. To run the experiment and see the block fall due to gravity, click Run.
4. Click Reset to reset the experiment.



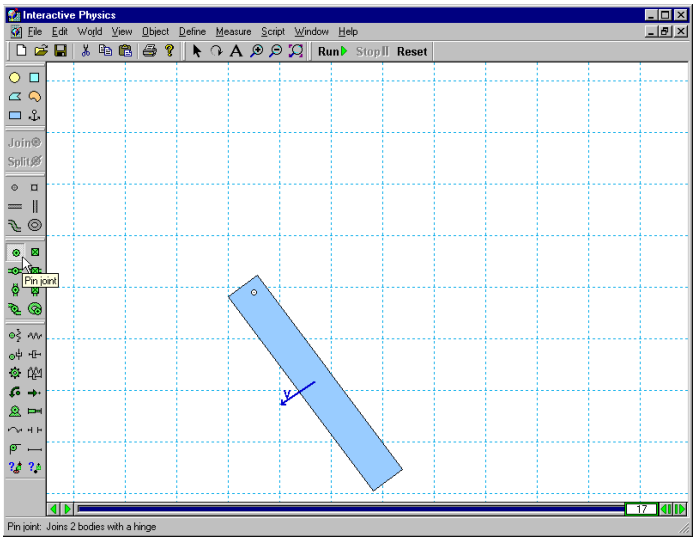
2 Adding a Velocity Vector

1. To add a velocity vector, click on the rectangle.
2. From the Define menu, click on Vectors and then Velocity.
3. Click Run and observe that the vector changes magnitude as the block falls.
4. Click Reset.

Optional: To add a numerical value to the velocity vector (or its components), click on the Define menu, select Vector Display, and check the Value box.

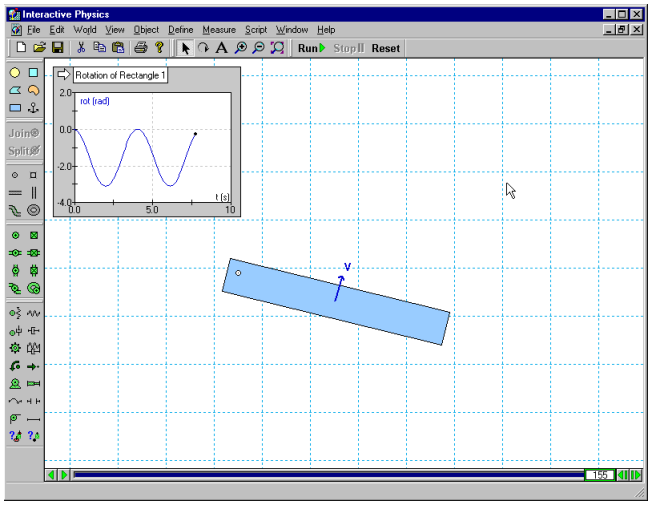
3 Making a Pendulum

1. To make a pendulum, click on the Pin joint tool and then click on the upper left-hand corner of the rectangle.
2. Click Run and observe that the vector changes magnitude and direction as the pendulum moves. Click Reset.



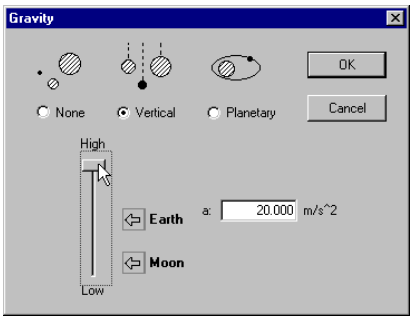
4 Graphing the Pendulum's Motion

1. To graph the pendulum's motion, click on the rectangle. Under the Measure menu, select Position, then select Rotation Graph.
2. To collect data, click Run. Note: Data can be displayed as a graph, bar chart, or number, and can be changed while running the experiment. Click Reset.
3. The graph shows the pendulum's amplitude and frequency. To make the graph larger, click on the graph and drag its lower right-hand corner to the right.



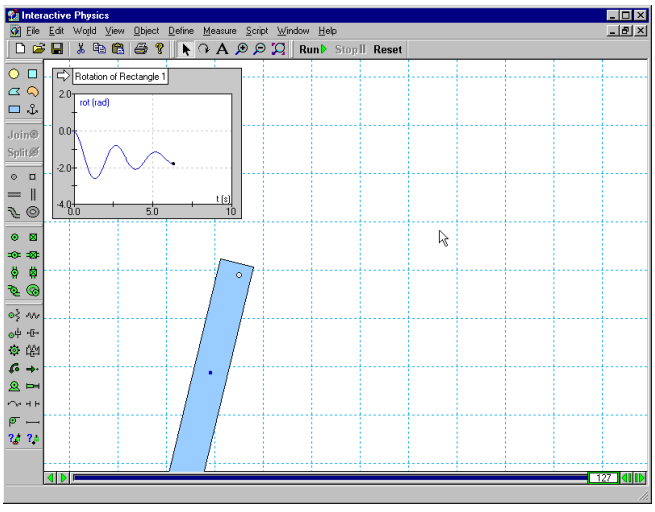
5 Changing Gravity

1. To change gravity, click on the World menu, select Gravity, slide the slider to the top for the value 20 m/sec^2, and click [OK].
2. Click Run and observe that, in agreement with theoretical and experimental predictions, the pendulum has a higher natural frequency. Click Reset.



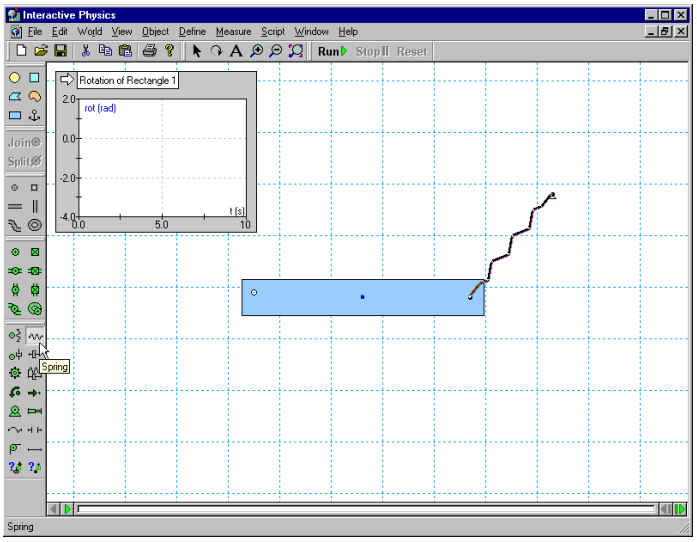
6 Adding Air Resistance

1. Under the World menu, select Air Resistance, click on Low Speed, and accept the default air resistance value of 0.3 kg/(m*s) by clicking [OK].
2. Click Run and observe the exponentially decaying oscillations. Click Reset.



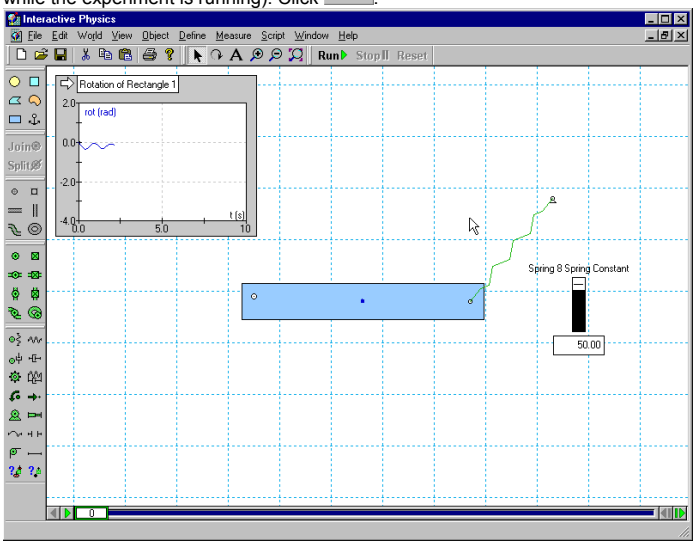
7 Adding a Spring

1. To add a spring, click on the Spring tool. Click on the upper right-hand corner of the block and stretch the spring up and to the right.
2. Click Run and observe the pendulum's higher natural frequency and new equilibrium position. Click Reset.



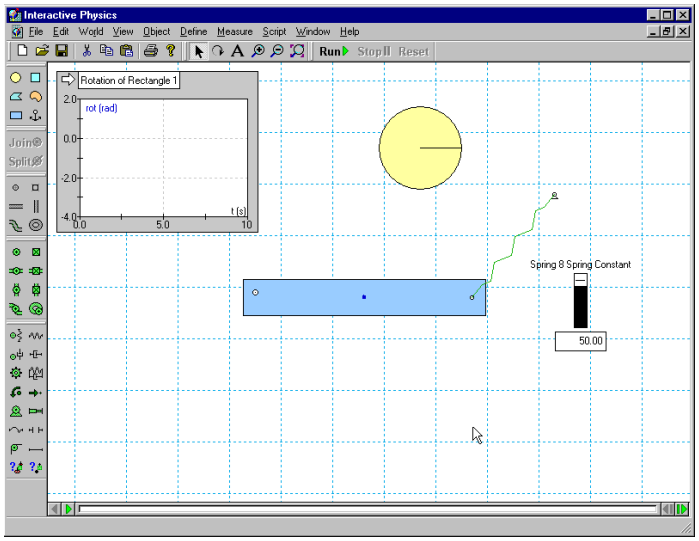
8 Controlling the Spring Constant

1. To control the spring constant, click on the spring. Under the Define menu, select New Control, then select Spring Constant.
2. The slider that controls the spring will appear in the left-hand side of the workspace. To move the slider's location closer to the spring, click on its **title** and drag it next to the spring.
3. To see the effect of varying the spring constant, click Run and observe that the pendulum angle is a function of the spring-constant (move the slider up and down while the experiment is running). Click Reset.



9 Collisions with a Circle

1. To create a circle, click on the Circle tool, then click in the workspace and draw a circle. (If your rectangle is high on the screen, click to zoom to extents.)
2. Click Run to start the experiment and observe that the circle bounces and rolls on top of the rectangle. Automatic collision and contact is a very useful feature in Interactive Physics (even the elastic and frictional properties of objects may be varied). Click Reset.



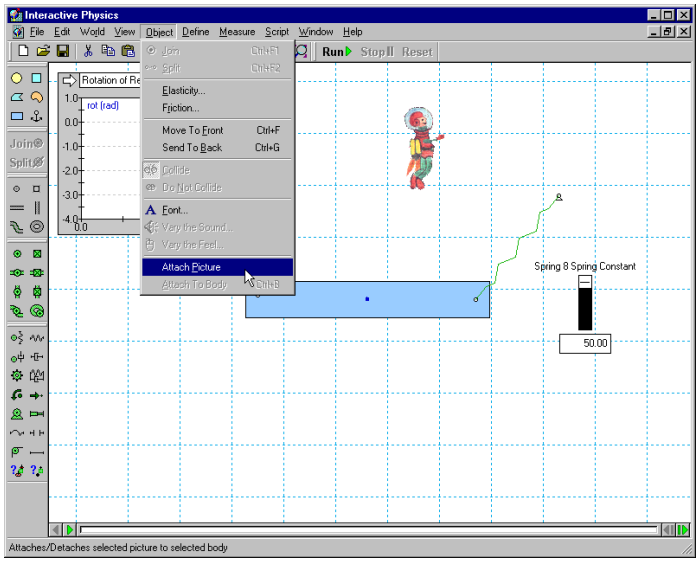
10 Attaching a Picture to an Object

1. To find the spaceman picture on Windows, select Start menu, then Programs, then InteractivePhysics, then the IPIntroduction folder.

Note: Mac users browse to Interactive Physics, then Picture Library, then People.

2. Double-click on the bitmap file “Spaceman.bmp.” This should open the bitmap in a program such as Paint.
3. In Paint, select the Edit menu and then choose Select All.
   Next, select the Edit menu again and then choose Copy.
4. Go back to Interactive Physics and select its Edit menu and then choose Paste.
5. To attach the spaceman bitmap to the circle, click on the spaceman, then hold down [Shift] while you click on the circle.
6. Select the Object menu and then Attach Picture. Notice that the circle object has disappeared and has been replaced by the spaceman image.
7. Click Run to run the experiment. Click Reset.

Note: Interactive Physics was designed to be easy-to-use. In this exercise, the only time you need to touch the keyboard is to hold down the [Shift] key.

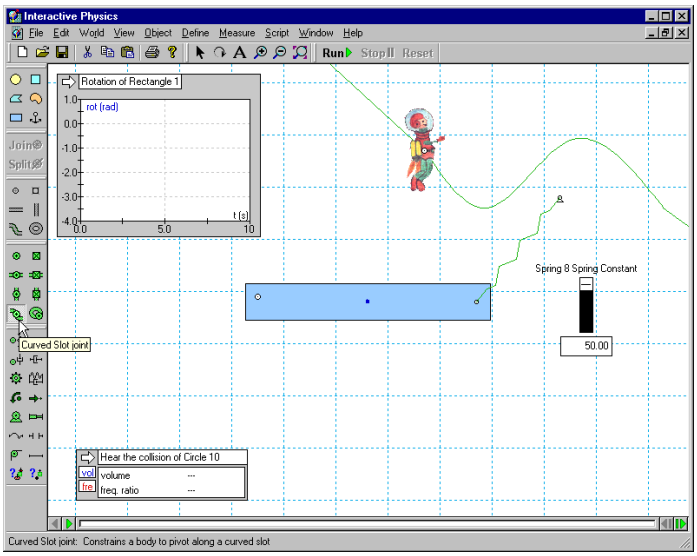


11 Adding Sound (Windows only)

1. Click on the spaceman, select the Measure menu and choose Hear the Collision.
2. Click Run to start the experiment and hear the sound when the spaceman contacts the block. Click Reset.

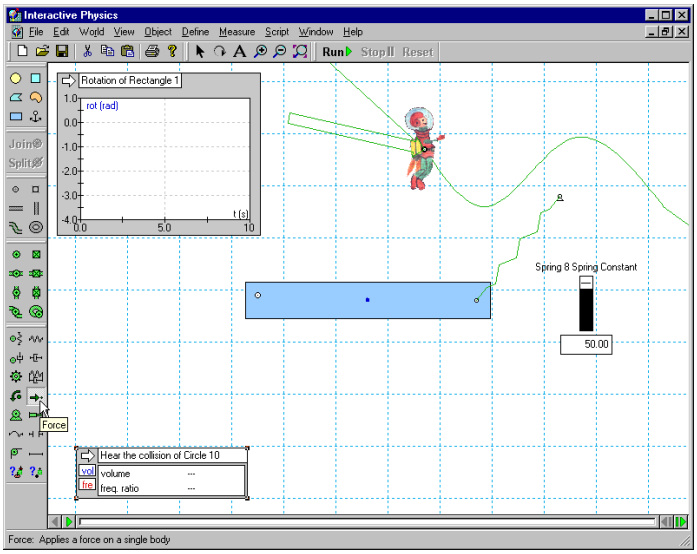
12 Adding a Curved Slot Joint

1. To add a Curved Slot Joint, click on the Curved Slot joint tool.
2. Click on the spaceman and then click on a couple of other places to the right of the spaceman, and then double-click to complete the slot (see figure below).
3. Click Run to start the experiment and observe that the spaceman slides down the curved slot. Click Reset.



13 Adding a Force

1. To add thrust to the spaceman to overcome air resistance, click on the Force tool, then click on the spaceman, then move the mouse to the left and click again.
2. Click Run to start the experiment and observe that the spaceman overcomes air resistance and moves more quickly along the curved slot. Click Reset.



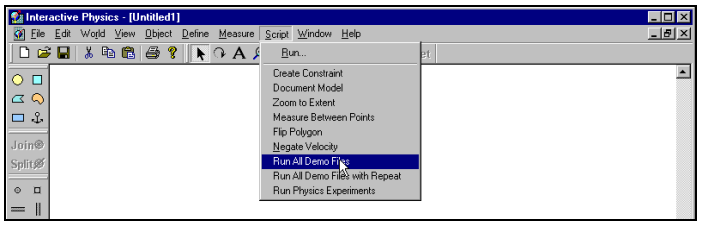
14 Running Demo Files

Windows users:

1. Under the Script menu, click on "Run All Demo Files."
2. Sit back and enjoy a series of demos on a variety of physics topics.
3. To quit, select the File menu and choose Exit.

Mac Users:

1. Browse to the For Demo Users folder installed with Interactive Physics.
2. Double-click on each of the files, then click Run.
3. To quit, select the File menu and choose Quit.



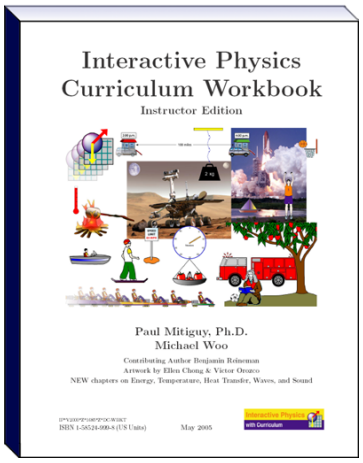
15 Curriculum Workbook

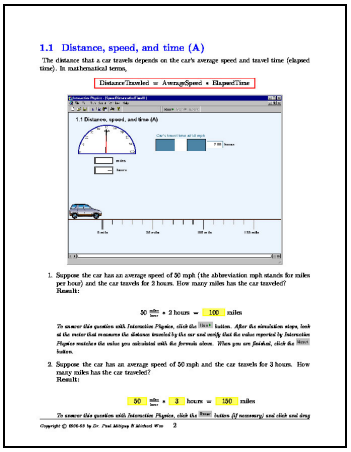
Supplementary workbooks with Interactive Physics exercises of varying difficulty are available with purchase. To try the instructional curriculum:

Windows users: Go to the Windows Start, then Programs, then InteractivePhysics, then click on StartCurriculum.html, then choose **Demo Users**.

Mac users: Open the installation CD and double-click on each of the files in the IPCurriculum folder. Follow the on-screen directions.

Note: The Demo Edition can open **only** Demo files. The Full Edition must be purchased to open the curriculum and additional 150+ physics experiments.





New interactive experiments explore concepts in Energy, Temperature, Heat Transfer, Waves, and Sound

Plus experiments in speed, distance, time, acceleration, force, weight, mass, gravity, and air resistance

New curriculum workbook correlated with National and State Educational Standards and Objectives

Full-color teacher edition and black-line master student edition

Interactive Physics

The Americas Price List – February 1, 2009

http://www.interactivephysics.com

Interactive Physics™	http://www.interactivephysics.com						UPGRADE[+] from IP5.0, IP2000, 2004[++], or higher (Windows)					
Description	Item No.	Price ($)	# of CDS	# of Manuals	# of TEW[*]	# of SCB[**]	Item No.	Price ($)	# of CDS	# of Manuals	# of TEW[*]	# of SCB[**]
Single User (node-locked)[***]	IP01NL	249	1	1	1	0	IP01NLUp	119	1	0	1	0
Additional Single User[***]	IP01	100	1	0	0	0	IP01Up	50	1	0	0	0
10 User	IP10	995	1	1	1	1:10	IP10UP	398	1	0	1	1:10
20 User	IP20	1,495	1	1	1	1:20	IP20Up	598	1	0	1	1:20
30 User	IP30	1,995	1	1	1	1:30	IP30UP	798	1	0	1	1:30
50 User	IP50	2,995	1	2	2	1:50	IP50Up	1,198	1	0	2	1:50
75 User	IP75	4,245	1	2	2	1:75	IP75Up	1,698	1	0	2	1:75
100 User	IP100	5,495	1	3	3	1:100	IP100Up	2,198	1	0	3	1:100
200 User	IP200	7,995	1	4	4	1:200	IP200Up	3,198	1	0	4	1:200
300 User	IP300	10,495	1	5	5	1:300	IP300UP	4,198	1	0	5	1:300
Custom User	IPCustom	Call	Call	Call	Call	Call	IpCustomUp	Call	Call	Call	Call	Call
Homework[9***]	IPHW	500	10	0	0	0	Requires 10+ user license of current Interactive Physics. Allows School to make an additional copy of SCB for each home license/CD purchased					
Workbook[9] Homework Bundle	IPHWWBK	850	10	0	0	10	Requires 10+ user license of current Interactive Physics.					
Student Curriculum Black-line Master	IPSCB	195	0	0	0	1:10	Requires 10+ user license of current Interactve Physics					
Student Curriculum Workbook[9]	IPSCW	495	0	0	0	10	Requires current Interactive Physics License					
IP Workbook College	IPSCHW	35	0	0	0	0	By Cindy Schwarz / John Ertel; Calculus-based physics					
Extra Manual	IPUSR	50	0	1	0	0	Requires current Interactive Physics license					
Spanish Manual	IPUSRSP	50	0	1	0	0	Requires current Interactive Physics license					
Training	IPACL	Call	Call	Call	Call	Call	Ancillary Curriculum License for special development, training, etc.					
Developer[10]	Call	2,500	1	1	0	0	For textbook publishers who bundle with 1000+ Textbook Editions					

[+]Interactive Physics upgrades will be accepted with corresponding valid IP5.0 or IP2000 serial number (Windows)

[++] Upgrades to IP2005 from IP2004 are $50 + 50% of the listed upgrade price.

Interactive Physics upgrades ship with installation instructions and an introductory tutorial. Information about new features is contained in the CD.

Mac Users: Macintosh customers should try a demo before purchasing to ensure OS compatibility (e.g., Mac OS X Tiger may not install classic mode).

Interactive Physics version 5.0 is the current version for the Macintosh and runs under classic mode in Mac OS X, not under native Mac OS X.

To run Interactive Physics under classic mode on Mac OSX Jaguar or later, it is necessary to log on as an administrator.

*TEW = Teacher Edition Workbook – part of a full purchase or upgrade product (not sold separately)

**SCB = Student Curriculum Black-line Master: one black line master is shipped with the right to reproduce copies for the exact number of licenses purchased

*** Single users and Homework users need to provide a machine ID to obtain a node-locked machine-specific installation serial number (not required for Network Licenses).

1 A copy of the school's purchase order and/or purchasing information must accompany all orders from the school ordering the software.

2 Orders to US and Canada: American Express, Visa, MasterCard, Discover, checks, purchase orders accepted.

3 International orders: American Express, Visa, MasterCard and bank wire transfers accepted. For orders shipped to destinations outside of the continental United States that are less than $1,000 shipping charges will be added to the order or a UPS, DHL, or Fedex account must be provided.

4 Sales tax is added unless a Federal Excise Exempt Certificate or Local Sales Use Tax Exempt Certificate is submitted with the purchase order.

5 When possible, orders are shipped within 48 hours.

6 All sales are final. If you are tentative about a purchase, ask for a demonstration copy.

7 To trade up from x users to y users (with or without an upgrade), use the following price calculation formula:
Trade-up price = (new y user price – new x user price) + x upgrade price (if applicable)
Example: 10 user upgrade trade-up to a new 30 user: ($1995 - $995) + $398 = $1398

8 Resellers are required to fax the school purchase order when placing an order.

9 Homework/Student Editions do not include manuals or technical support and are only for student use on student-owned computers (not for school computers).
Homework/Student Edition licenses are valid for one year and are limited to 50 bodies, 15 constraints, and 15 output meters.

10 Textbook Editions are licensed with a Developer version and are able to play simulations created by a developer (for publishers etc.)

11 Technical support is provided by your software vendor for the first four months of new or upgrade purchases.

12 Multi-user licenses are networkable.

13 Prices and terms are subject to change without notice.