Introduction to Airplane Design

A Theme for Math and Science With Hands-On Lessons
By: Seeds Software

About the Software

Introduction to Airplane Design is a fun software package that provides an incredible way to use technology in the classroom. This software makes it easy to teach an exciting aerospace unit. By using interactive simulations and powerful design tools you will be impressed at how fast students learn. Have your students analyze and design their own performance gliders on the computer and then build and test their designs off-line. As they learn more they can advance to powered flight by including a rubber band motor and propeller in their designs. Your students can explore their world by taking flight!

Climb into our software and take your class soaring to new levels of excitement and learning!

This software package provides much more than game fun, it teaches science with challenge, inquiry, and accountability, yet it is easy to implement and use, and classroom tested. The in-depth content of this package can provide 1 to 8 weeks of classroom curriculum that nicely fits learning standards, or can be a comprehensive resource. For grades 7 -12.

The package includes lessons and numerous activities and plans for labs which keeps the students actively involved with the software, gives the students the opportunity to test aerodynamic principles using a wind tunnel simulation and flying aircraft, and helps them to understand how to design their own aircraft that fly well. These lessons will free up more time for you to teach!

Science of Software

Science Principles Include:

Balance of Forces
Centrifugal Action
Energy
Force
Geometric Change
Newton's Laws
Power
Supersonic
Bernoulli's Principle
Density
Fluid
Friction
Line of Action
Moment or Torque
Pressure
Velocity

Important Aerodynamic Concepts:

Gravity
Thrust
Stability
Lift
Drag
Control

Important Design Principles:

Airfoil Shape
Wing Configuration
Control Surfaces
Dihedral
Wing Shape
Tail Requirements
Balance and Trim
Propulsion

Aircraft Design Computer:

Easy input of dimensions
3-D visual of the aircraft design
In-depth analysis of performance
Detection and explanations of design problems
Simulation of glide performance

Software Content:

28 computer simulations
58 detailed explanations of principles
22 colorful and illustrative diagrams
10 graphs of aerodynamic trends

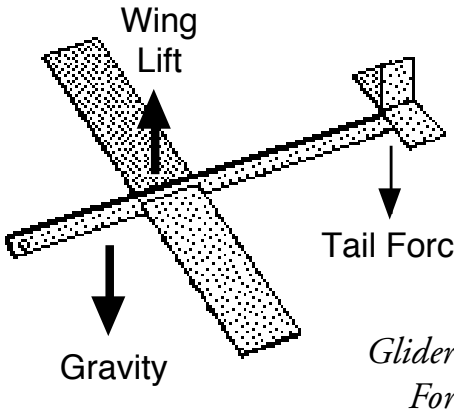
Optional Activities and Labs:

16 classroom activity lessons with objectives
10 hands-on lab plans with material lists
Detailed design and build guides
Answers, teachers notes, and 5 quizzes

Connect Technology to the Real World

The Hands-On Advantage

Do you know why and how to design a tail to balance (trim) an airplane or glider? Use the software and hands-on activities provided to clearly explain and develop an understanding of aerodynamic concepts like this while making use of and synthesizing many physics principles.



Glider Trim Forces

The labs in the lessons activities and labs folders provide students with the opportunity to actually test out many principles and exercise careful use of scientific methods in testing and examining results. The labs can be used to help them understand aerodynamic concepts and experiment with how configuration effects flight performance. They provide additional learning styles and help students assimilate and apply what they are studying.

Harness the Computer's Impressive Power

Use the computer to help you design your aircraft

Challenge students to make use of their understanding of principles and concepts and come up with their own aircraft designs. Give them the experience and insight on how the computational power of computers is used to find solutions in the real world. Empower students with the science and technology that enables them to design and build their own aircraft that fly well. Learning will soar!

System Requirements

At least a 256 color monitor

Hybrid (CD-ROM):
Macintosh PowerPC/Intel OSX or
Windows NT/2000/XP/Vista/Win7
At least 4xCD-ROM Drive

Macintosh (Network CD Image):
Macintosh Intel/PPC OSX
15 MB of available RAM
7.0 MB of Disk Space

Windows (Network CD Image):
Windows NT/2000/XP/Vista/Win7
15 to 25 MB of RAM (depending on OS)
4.0 MB of Disk Space

Software Prices

Single Computer License $ 137.00
Multi-Computer License Discounts Available

Seeds Software

For Growing Knowledge and Understanding

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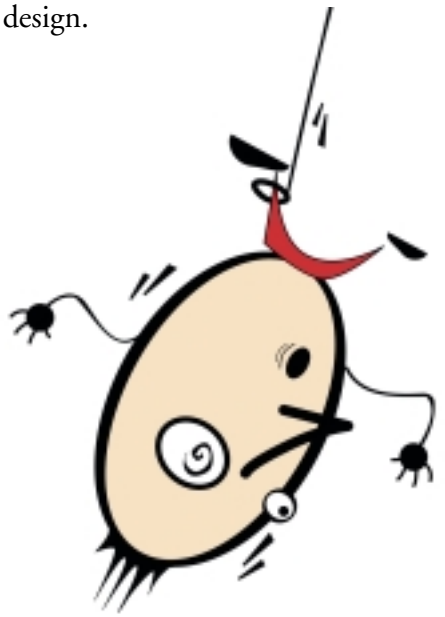
The Bungee Egg Challenge

A Theme for Math and Science With Hands-On Lessons

By: Seeds Software

About the Software

The Bungee Egg Challenge is a software package to learn math and science. Most egg drop projects are big on fun but lacking in science, being trial and error. With the Bungee Egg Challenge, students can experience the thrill and fulfillment of using science to achieve success as well! You can use technology wisely to get students to think and design.



Drop eggs the scientific way and rebound with a wealth of knowledge and understanding

This software package provides much more than game fun, it teaches science with challenge, inquiry, and accountability, yet it is easy to implement and use, and classroom tested. Students must do experimental science and make use of realistic design processes to successfully protect their egg from a reasonable drop height. The software nicely fits many learning standard. It is designed for grades 8 to 12.

Additional Egg Activities and Lab write-ups provide numerous lessons to keep the students actively involved. It includes plans for labs which have the students perform careful experiments to determine the stretch properties of candidate chord materials. The students must decide which chord materials to use to suspend their egg inside a container and input the properties into the computer to predict what happens to the egg when dropped.

Science of Software

Science Principles Include:

Damping	Elasticity
Forces	Gravity
Impact	Kinetic & Potential Energy

Important Design Considerations:

Energy Absorption
Energy Dissipation
Harmonic Motion
Statistical Design Allowable
Stiffness and Displacements

Egg Drop Computer Simulation:

Easy input of dimensions and properties
Visual view of the egg container design
Simulation of the drop event
In-depth analysis of the impact dynamics
Detection and simulation of failures
Time plots of egg motion energy & acting forces

Software Content:

8 detailed explanations of physics principles
10 computer simulations
17 physical science formulas explained
10 interactive graphs of physics trends

Additional Activities and Labs Disk:

11 classroom activity lessons with objectives
5 hands-on lab plans with material lists & notes
Answers and teachers notes

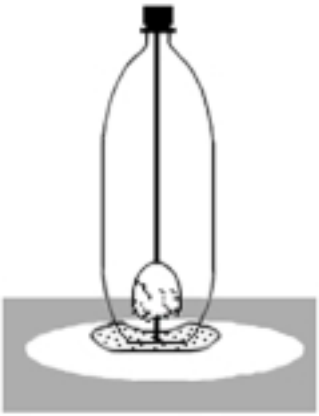
Experimental Testing in Labs:

Stretch characteristics of chords
Internal friction in stretching chords
Strength of eggs
Dynamic impact drop event

Connect Technology to the Real World

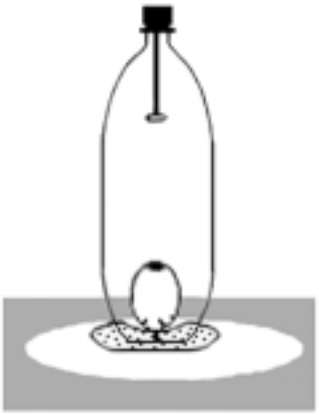
The Hands-On Advantage

How do you determine if an egg will survive a given drop height suspended inside a bottle? Do you know what forces develop, where the best place to position the egg is inside the bottle, how much the chords will stretch, how fast energy is dissipated? With this package you can show students how science principles can be used to answer these questions. You can simplify a very exciting but advanced problem down into understandable concepts. Students can assemble and assimilate science and technology to do realistic designs using an elegant but easy to run computer solution.



If the chords are too soft, the egg will crash or slingshot into the bottle and SPLAT! when the bottle hits the ground

If the chords are too stiff, the egg will pull apart and break when the bottle hits the ground



The labs available in the Lessons folders show students how to conduct tests to determine the stretching and internal friction characteristics present in likely chord suspension materials. The tests give the students an appreciation of how important it is to take careful scientific measurements and how these measurements can be used; test results are used as properties by the software to calculate what happens to the egg inside the container when it impacts the ground.

System Requirements

At least a 256 color monitor

Hybrid (CD-ROM):
Macintosh PowerPC/Intel OSX or
Windows NT/2000/XP/Vista/Win7
At least 4xCD-ROM Drive

Macintosh (Network CD Image):
Macintosh Intel/PPC OS X
6.0 MB of available RAM
7.0 MB of Disk Space

Windows (Network CD Image):
Windows NT/2000/XP/Vista/Win7
8 to 16 MB of RAM (depending of OS)
4.0 MB of Disk Space

Software Prices

Single Computer License $ 97.00
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Global Warming: Understanding Greenhouse Gases

A Theme for Math and Science With Hands-On Lessons
By: Seeds Software

About the Software

Global warming is an incredibly rich theme to teach your students science while investigating a very important environmental issue. With this package you can provide students with an understanding of the science behind global warming instead of just having them look at the data of predictions. The package includes an authentic global climate model to use to find answers and take ownership of predictions.

Study the environment to learn science and physics

This software package provides much more than game fun, it teaches science with challenge, inquiry, and accountability, yet it is easy to implement and use, and classroom tested. The in-depth content of this package can provide 1 to 8 weeks of classroom curriculum that nicely fits many learning standards, or can be a comprehensive resource. For grades 8-12.

Included in the package are write-ups of lessons and numerous hands-on labs in a modifiable format. These lessons and labs keep the students actively involved with the software, give the students the opportunity to test scientific principles, and help them to get an intuitive feel of the principles. The lessons will free up more time for you to teach!

Science of Software

Science Principles Include:

Absorptance
Blackbodies
Energy Equilibrium
Inverse Sq. Law
Photons
Planet Atmospheres
Radiation Spectrum
Specific Heat
Transmittance
Beer -Lambert Law
Emittance
Heat Capacity
Kirchoff's Law
Planck's Law
Radiance
Resonance
Stefan-Boltzmann Law
Waves

Supporting Material:

The content on global warming, and the global climate model, are based extensively on the final reports of the Intergovernmental Panel on Climate Change (IPCC 1990-2001). These recent reports include the preparation, workings, and review of hundreds of leading scientists from 25 counties. The reports represent an information source of the finest quality and authority.

Simulations & Global Climate Model:

The software provides simulations of many of the important concepts needed to understand global warming. These simulations make the concepts much more accessible and meaningful to students than they are in text books. The global climate model included has a simple elegance. It is easy to use with clear understandable results; yet it unleashes the incredible computational power of computers and uses many advanced methods to deliver compelling inferences on the future of the Earth.

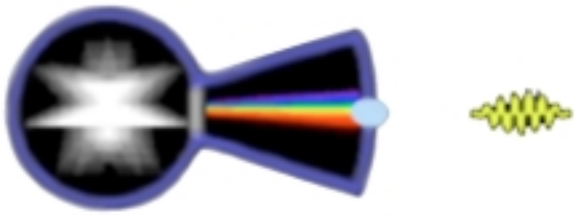
Activities and Labs:

9 classroom activity lessons with objectives
9 hands-on lab plans with material lists
Answers and teachers notes

Connect Technology to the Real World

The Hands-On Advantage

Everyone has read something about global warming and how our emissions and activities may be causing climate changes. But how many individuals really understand the science behind the information? Consider how much more meaningful and comprehensible this important information can be with a working knowledge of the processes that are causing change.



Simulations of important concepts improve learning speed and comprehension

Computer Simulations:

The concepts of global warming are more than publications of predictions and observation of data, it involves an astonishing amount of science that is extremely challenging for scientists. By using computer simulations in combination with off-line labs many of the fundamentals are made accessible and understandable to students, abstractions and advanced formulas become animated and intuitive. Students can use the package to learn why climate change is a very real environmental issue.

Turn your students onto technology. Give them the experience and insight on how the computational power of computers and technology are used to study the real world. Empower students with the science and technology that enables them to understand their environment. Students can do more than play games or look at data. Don't be surprised to find your students far more interested and intrigued doing real science with powerful science tools. With our authentic global climate model you can give them ownership of global warming issues and the many science principles involved.

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Science Methods: Searching for Solutions Experimentally

A Theme for Math and Science With Hands-On Lessons
By: Seeds Software

About the Software

Science Methods: Searching for Solutions Experimentally is a software package to teach students how math and science can be used to find experimental solutions; it introduces students to the important ideas and methods of Experimental Design.

A simple theme of color mixing and matching is used as a model example of many real world problems that embody several inputs which combine to form a result. The problem is to find how much of each input is needed to get the results that you want. For color mixing, students have fun trying to find the amounts of the colors red, green, and blue required to match a specimen color of unknown formulation.

Illuminate Science with Colors!

The natural tendency is to try to solve these problems using trial and error. With this package students will discover how ineffective guessing is and learn to make use of math and science methods to efficiently converge to desired solutions. The software is structured to work over a wide range of abilities and can be used to support many learning standards. The package is classroom tested and is recommended for grades 5-12.

Science of Software

Color Theory:

Introduce students to color theory and how monitors use primary colors to generate a wide spectrum of hues while having fun and doing challenging activities.

Science Methods Include:

Pattern Recognition
Information Modeling
Accuracy and Error Measurement
Systematic Problem Solving
Solution Convergence

Solution Strategies:

Guess
Error Measurement
Bisection
Ratio
Gradient

Software Content:

Five Computer Simulations of Color Mixing & Problem Solving Methods
3 Dimensional Information Modeling
Simulation of Experimental Design Scenarios

Activities and Labs:

6 classroom activity lessons with objectives
2 hands-on lab plans with material lists, notes
Answers and explanations

Applicable Science Curriculum

Astronomy
Biology
Chemistry
Other Physical Sciences
Physics