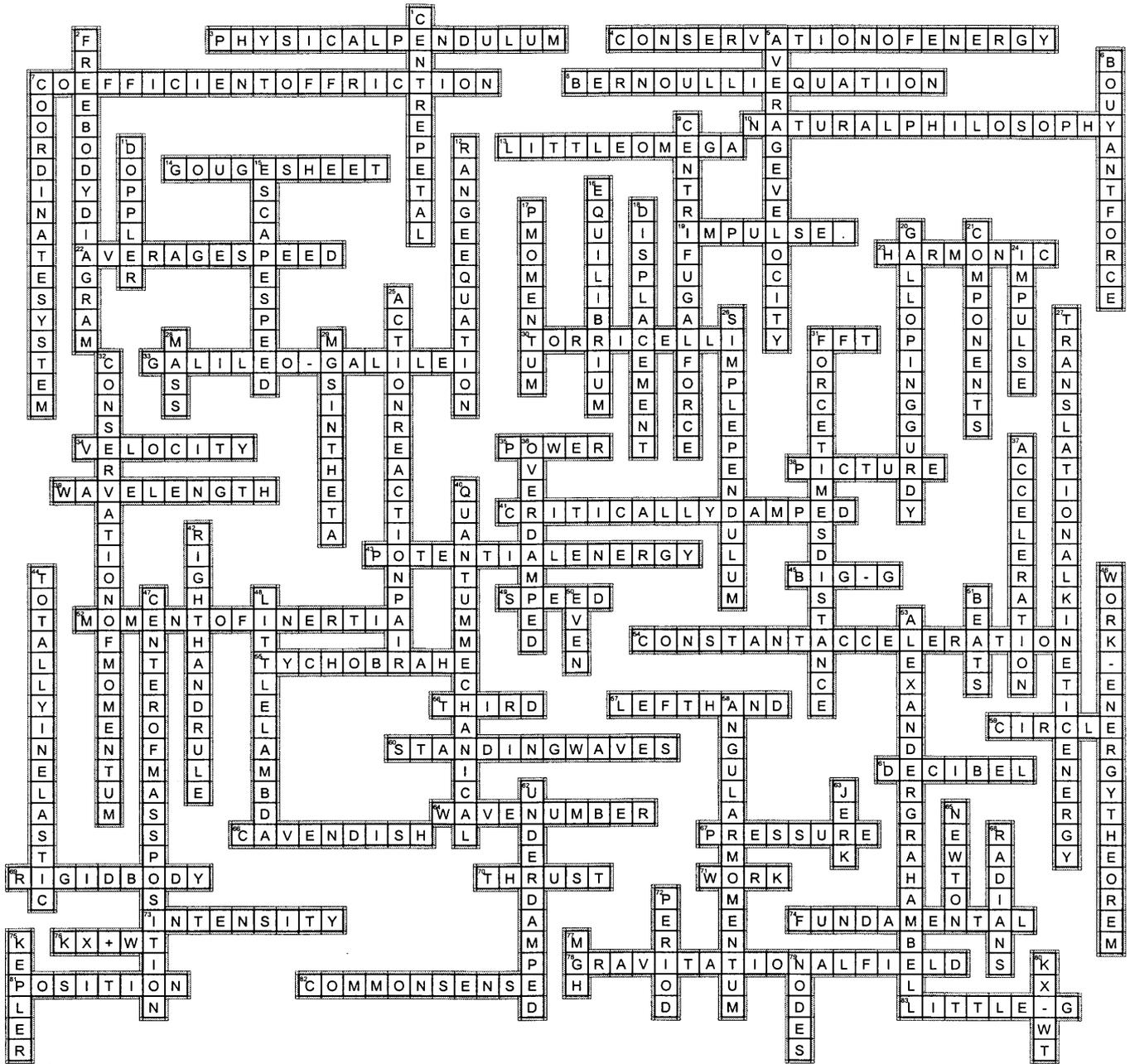


# Activity

jrv



EclipseCrossword.com

## Across

3. PHYSICALPENDULUM —  $T = 2\pi \sqrt{\frac{m}{g}}$
4. CONSERVATIONOFENERGY — A simpler technique that can be used to predict the position or speed of a system of objects.
7. COEFFICIENTOFFRICTION — The proportionality constant between the normal force and the kinetic frictional force.
8. BERNOULLIEQUATION — A formula that can be thought of as conservation of energy for fluid motion.
10. NATURALPHILOSOPHY — Before about the year 1900, the field of physics was called \_\_\_\_.
13. LITTLEOMEGA — The Greek letter used for angular velocity, angular frequency, and the natural frequency of oscillation of a SHO.
14. GOUGESHEET — An equation sheet used on the final exam which contains equations that most people already remember anyway.

# Activity

jrv

## Across

19. IMPULSE. — Time integral of the net force.
22. AVERAGESPEED — total distance traveled / elapsed time.
23. HARMONIC — A numbering scheme for the allowed modes of oscillation.
30. TORRICELLI — A guy from Italy who should have spent his time making different shaped noodles for macaroni & cheese, but instead invented the barometer and some other math and physics stuff.
31. FFT — A mathematical technique used to extract the frequency components and their corresponding amplitudes from a periodic signal.
33. GALILEO-GALILEI — I guess his parents couldn't think of two different names, so they named him \_\_\_\_\_. (That ,or they were cruel. I bet he got picked on alot on the playground.)
34. VELOCITY — a vector specifying how the position vector is changing with time.
35. POWER — Rate of energy change or transfer.
38. PICTURE — The most important step in working any physics problem is to draw a \_\_\_\_\_.
39. WAVELENGTH — The distance over which a period function repeats.
41. CRITICALLYDAMPED — A simple harmonic oscillator system whose return to a steady equilibrium system is the quickest possible.
43. POTENTIALENERGY — For conservative forces, one can define \_\_\_\_\_ functions.
45. BIG-G — Gravitational constant  $6.67e-11 \text{ Nm}^2/\text{kg}^2$
49. SPEED — Magnitude of the velocity vector.
52. MOMENTOFINERTIA — The proportionality constant between angular acceleration and the net torque.
54. CONSTANTACCELERATION — Many problems in intro physics courses are of the \_\_\_\_\_ variety because otherwise the mathematics becomes too involved to illustrate the concepts and ideas.
55. TYCHOBRAHE — Had his nose sheered off in a duel. Died because he had to go to the bathroom, but didn't.
56. THIRD — Kepler's \_\_\_\_ law,  $T^2$  is proportional to  $r^3$ , is a result of the inverse square gravitational force law.
57. LEFTHAND — SP212 finals are occasionally hilarious to watch because some people use their \_\_\_\_\_ to do right hand rule calculations.
59. CIRCLE — For a particle travelling in a \_\_\_\_\_, the radial component of the acceleration vector positively, absolutely, must be  $v^2 / r$  .
60. STANDINGWAVES — \_\_\_\_ can result from the superposition of two waves of the same frequency and wavelength traveling in opposite directions.
61. DECIBEL — A strange logarithmic scale of measurement.
64. WAVENUMBER — A bizzare quantity related to wavelength that chemists and crystallographers like to use.
66. CAVENDISH — Most pictures of \_\_\_\_ have him looking to the left with a stupid-looking British hat on.
67. PRESSURE — A quantity that can be specified in at least a dozen different units.
69. RIGIDBODY — Not a squishy one.
70. THRUST — The apparent force on a portion of a system that is shedding mass.
71. WORK — The integral of the dot product between a force and the infinitesimal displacement vector.
73. INTENSITY — power / area
74. FUNDAMENTAL — The lowest frequency mode of oscillation in a standing wave system.
76. KX+WT — The argument of a  $\sin()$  or  $\cos()$  in a wavefunction which is moving along the -x axis.
78. GRAVITATIONALFIELD — The vector that one multiplies the mass by to get the gravitational force. Near the surface of Earth, it has the magnitude 9.8 and units of  $\text{m/s}^2$  .
81. POSITION — A vector quantity describing the location of the center of mass of an object.
82. COMMONSENSE — Rather than memorize equations with weird subscripts, "relative velocity" problems are best worked by jotting down a \_\_\_\_\_ expression for the velocity addition.
83. LITTLE-G — gravitational field

## Down

1. CENTREPETAL — inward radial direction
2. FREEBODYDIAGRAM — A simple sketch that is drawn and annotated with force vectors.
5. AVERAGEVELOCITY — Net displacement / elapsed time.
6. BOUYANTFORCE — Is calculated as the weight of fluid displaced.
7. COORDINATESYSTEM — A reference grid constructed with orthoganal axes.
9. CENTRIFUGALFORCE — The un-enlightened often refer to this description of forces.
11. DOPPLER — A dude from Salzberg, Austria who couldn't get a real job and had to become an astromer and mathematician instead.

# Activity

jrv

## Down

12. RANGE EQUATION — A simple equation that students like to use to determine the range of a projectile; however, the equation is almost worthless because it applies only to a very restricted situation.
15. ESCAPE SPEED — The minimum speed that must be given to an object at the surface of a planetary body to escape the gravitational field.
16. EQUILIBRIUM — situations where acceleration=0.
17. PMOMENTUM — Should have been spelled this way.
18. DISPLACEMENT — A shift in the position vector.
20. GALLOPING GURDY — Name of the former bridge near Tacoma Narrows, Washington.
21. COMPONENTS — Mathematical operations on vector quantities involving numbers generally must be worked out by \_\_\_\_\_.
24. IMPULSE — Change in the momentum vector.
25. ACTION REACTION PAIR — Two selected forces which act on different objects, which have the same magnitude and opposite direction, whose wording satisfies the specification of Newton's 3rd law.
26. SIMPLE PENDULUM —  $T = 2\pi \sqrt{L/g}$
27. TRANSLATIONAL KINETIC ENERGY — A type of energy associated with the translation of the center of mass of an object.
28. MASS — The proportionality constant between the acceleration vector and the net force vector.
29.  $mg \sin \theta$  — The component of the gravitational force down an inclined plane has this value, provided  $\theta$  is the tilt angle.
31. FORCE-TIME-DISTANCE — It's very rare that work can be calculated with this formula.
32. CONSERVATION OF MOMENTUM — A technique that is always applied first in case of a collision problem.
36. OVERDAMPED — An oscillator system with such a large damping force that it takes a long time to return to steady equilibrium, -- without oscillation.
37. ACCELERATION — A vector describing how the velocity vector changes with time.
40. QUANTUM MECHANICAL — The standing wave modes on a string are actually a large macroscopic \_\_\_\_\_ effect.
42. RIGHT-HAND RULE — A convention used for specifying directions of rotational vectors.
44. TOTALLY INELASTIC — After the collision, the objects stick together and move as one.
46. WORK-ENERGY THEOREM — A very painful way to work conservation of energy problems.
47. CENTER OF MASS POSITION — The mass-weighted "average" position of an individual object or a collection of objects.
48. LITTLE LAMBDA — The Greek symbol used for both linear density and wavelength.
50. EVEN — \_\_\_\_\_ harmonics are absent in an organ pipe with one closed end.
51. BEATS — \_\_\_\_\_ occur when two waves of different frequency are added.
53. ALEXANDER GRAHAM BELL — The decibel was named after the Bell System's founder \_\_\_\_\_.
58. ANGULAR MOMENTUM — Kepler's 2nd law is a result of the conservation of \_\_\_\_\_ for a binary orbiting system.
62. UNDERDAMPED — A simple harmonic oscillator with a dissipative force whose oscillations slowly die away.
63. JERK — A vector describing how the acceleration vector changes with time.
65. NEWTON — Much of calculus is his fault.
68. RADIANS — The "natural units" used to measure angles.
72. PERIOD — The time over which an oscillation repeats.
75. KEPLER — His mother ran a bar in Regensburg, Germany. He stole Tycho Brahe's data in order to sell higher quality horoscopes.
77. MGH — A formula for the gravitational potential energy that can only be used if the altitude change of an object is very small compared to the Earth's radius.
79. NODES — Places on a standing wave that do not move away from the equilibrium position.
80. KX-WT — The argument of a  $\sin()$  or  $\cos()$  in a wavefunction which is moving down the +x axis.

# Activity

jrv

## Word bank

ACCELERATION ACTIONREACTIONPAIR ALEXANDERGRAHAMBELL ANGULARMOMENTUM  
AVERAGESPEED AVERAGEVELOCITY BEATS BERNOULLIEQUATION BIG-G BOUYANTFORCE  
CAVENDISH CENTEROFMASSPOSITION CENTREPETAL CENTRIFUGALFORCE CIRCLE  
COEFFICIENTOFFRICTION COMMONSENSE COMPONENTS CONSERVATIONOFENERGY  
CONSERVATIONOFMOMENTUM CONSTANTACCELERATION COORDINATESYSTEM CRITICALLYDAMPED  
DECIBEL DISPLACEMENT DOPPLER EQUILIBRIUM ESCAPESPEED EVEN FFT  
FORCETIMESDISTANCE FREEBODYDIAGRAM FUNDAMENTAL GALILEO-GALILEI GALLOPINGGURDY  
GOUGESHEET GRAVITATIONALFIELD HARMONIC IMPULSE IMPULSE. INTENSITY JERK  
KEPLER  $KX+WT$   $KX-WT$  LEFTHAND LITTLE-G LITTLELAMBDA LITTLEOMEGA MASS MGH  
MGSINTheta MOMENTOFINERTIA NATURALPHILOSOPHY NEWTON NODES OVERDAMPED  
PERIOD PHYSICALPENDULUM PICTURE PMOMENTUM POSITION POTENTIALENERGY POWER  
PRESSURE QUANTUMMECHANICAL RADIANS RANGE EQUATION RIGHTHANDRULE RIGIDBODY  
SIMPLEPENDULUM SPEED STANDINGWAVES THIRD THRUST TORRICELLI  
TOTALLYINELASTIC TRANSLATIONALKINETICENERGY TYCHOBRAHE UNDERDAMPED VELOCITY  
WAVELENGTH WAVENUMBER WORK WORK-ENERGYTHEOREM