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sinusoidal motion with a constant oscillation frequency is a mathematical idealization like point masses and frictionless surfaces but one that is very useful in approximating real systems such as the pendulum of a grandfather simple harmonic motion can serve as a mathematical model for a variety of motions but is typified by the oscillation of a mass on a spring when it is subject to the linear elastic restoring force given by hooke s law the motion is sinusoidal in time and demonstrates a single resonant frequency simple harmonic motion mbl in this experiment you will use a pendulum to investigate different aspects of simple harmonic motion you will first examine qualitatively the period of a pendulum as well as the position velocity and acceleration of the pendulum as a function of time simple harmonic motion in physics repetitive movement back and forth through an equilibrium or central position so that the maximum displacement on one side of this position is equal to the maximum displacement on the other side the time interval for each complete vibration is the same particular type of periodic motion where the motion repeats in a sinusoidal way is called simple harmonic motion two examples of simple harmonic motion are the oscillations of a pendulum when the displacement is small and the oscillation of a mass on a spring in this lab simple harmonic motion will be examined using a mass on a spring analogy of simple harmonic motion to circular motion a device which you crank around fits on a projector and moves around the circle while another dot projected on a diameter 2x10 says underneath

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dot and executes simple harmonic motion the simple harmonic oscillator is of great importance in physics because many more complicated systems can be treated to a good approximation as harmonic oscillators examples are the pendulum a stretched string indeed all musical instruments the molecules in a solid and the atoms in a molecule lab manual appendix c objective to investigate simple harmonic motion using a simple pendulum and an oscillating spring to determine the spring constant of a spring theory let s look at various aspects of simple harmonic motion including energy motion relationship with circular motion and relationship with pendulum motion 1 1 energy of simple harmonic motion the simple harmonic oscillator is an example of conservation of mechanical energy when the spring is stretched it has only potential energy $u = \frac{1}{2} kx^2$ lab manual appendix b objective to investigate simple harmonic motion using a simple pendulum and an oscillating spring to determine the spring constant of a spring theory in what is known as simple harmonic motion shm in this experiment you will examine this type of motion by studying the periodic motion experienced by a vertical mass attached to a spring laboratory manual the science of sound fiore 3 simple harmonic motion expand collapse global location physics lab manual the purpose of this lab is to investigate simple harmonic motion in two simple systems a mass hanging on a spring and a simple pendulum 1 download the simple harmonic motion worksheet 2 choose five different rod lengths between 0 and 1 m enter the data in table 3 separate books by

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to 1 kg below the gravity slider select earth from the drop down set friction to none 4 in the bottom left corner select the stopwatch checkbox or use your stopwatch 5 for a mass on an ideal spring spring has no mass the position as a function of time is described by simple harmonic motion $x = A \cos(\omega t + \phi)$ where A is the amplitude of the oscillations ω is the angular frequency and ϕ is the phase constant

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$\cos \omega t + \phi$ where ϕ is the amplitude of the oscillations ω is the angular frequency and ϕ is the phase constant

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