

EXPERIMENT 1500-12

HOOKE'S LAW AND SIMPLE HARMONIC MOTION

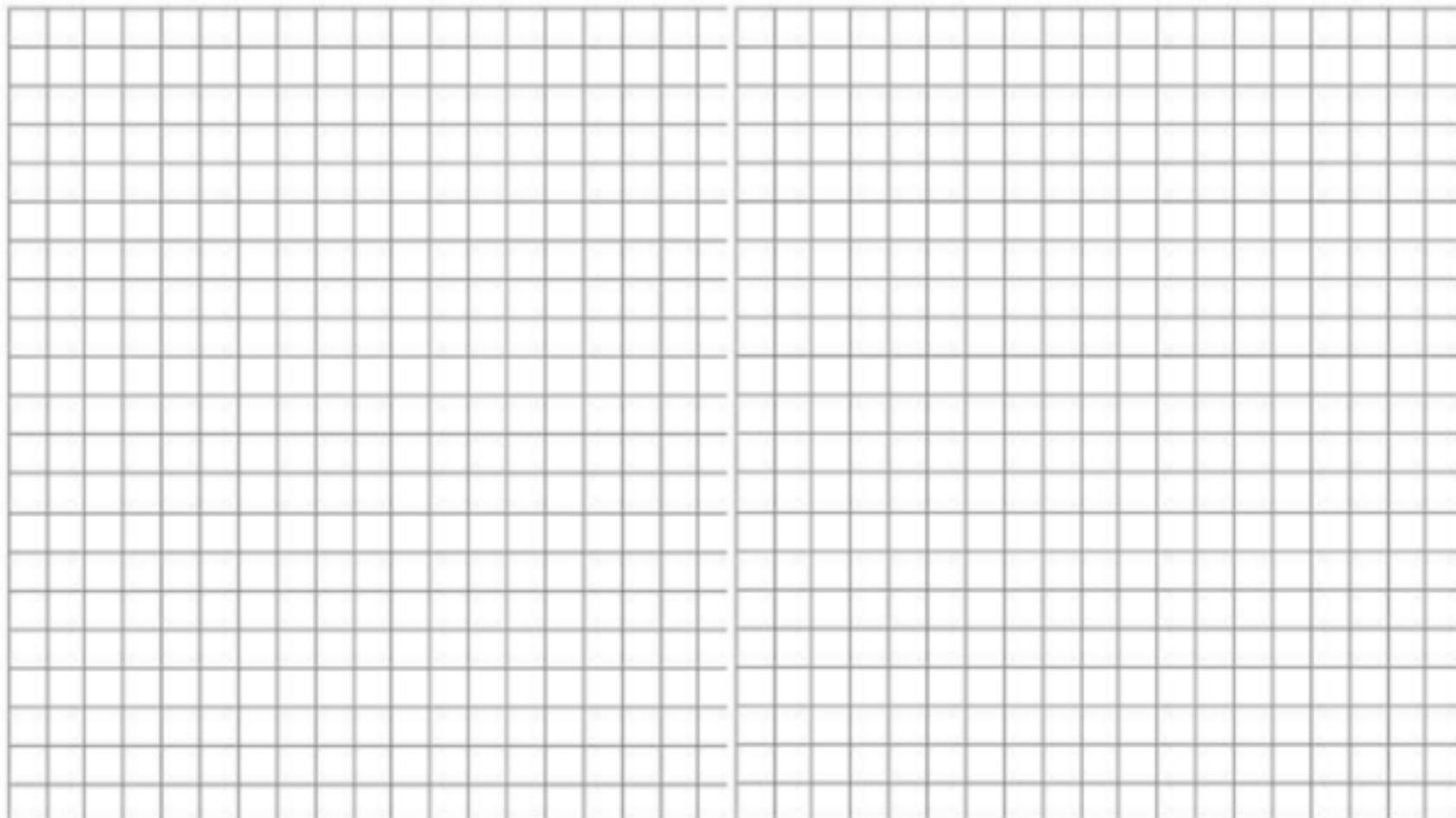
NAME:

INTRODUCTION

Oscillatory systems are extremely common in nature. Examples abound, from the vibrations of molecules to the beating of the heart. The motion of a mass on a spring is one of the simplest forms of oscillatory motion, and is called *simple harmonic motion*.

PART A: MASS AND SPRING

At your table you have a set of masses and a spring suspended from a beam. Springs will generally obey Hooke's law, $F = -kx$, unless they are stretched to extremes, where 'x' is the linear extension from an equilibrium position, and 'F' is the additional force applied after the equilibrium has been established. By measuring 'x' and 'F', we can determine the stiffness of the spring, 'k', often referred to as the *spring constant*. We can stretch the spring by hanging a mass from its end. Measure the resulting elongation of the spring, and determine the weight of the mass, starting a table that lists the force as a function of the elongation. Keep adding mass in reasonable increments. Find the spring constant by putting your data in a force-versus-elongation plot on the graph paper below. Label the axes; include units. The spring constant is the slope of the graph.



$k =$ _____