

**What is the relationship between the damping coefficient of a spring-mass oscillator submerged in different liquids and the densities of the liquids?**

Physics HL

Internal Assessment

Word count: TBD

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# **1 Introduction**

This essay extends the investigation of simple harmonic motion by studying the damping coefficient and force of a damped oscillator submerged in water. Controlling damping through density is important in real-life systems ranging from shock absorbers to the stabilization of automobiles. The setup of the experiment consists of mainly a spring-mass oscillator submerged in a glass cylinder of liquid.

## **1.1 The Research Question**

How Accurately Can Stoke's Law Estimate the Damping Coefficient of a Spherical Spring-Mass Simple Harmonic Oscillator Submerged in a Liquid?

## 1.2 Background Information

### 1.3 Hypothesis

### 1.4 Variables

## 2 Main Body

### 2.1 Data Collection

#### 2.1.1 Apparatus and Materials

#### 2.1.2 Procedures and Reproducing the Experiment

#### 2.1.3 Risk Assessment

### 2.2 Data Processing

### 2.3 Data Analysis

#### 2.3.1 Uncertainty Analysis

## 3 Conclusion

### 3.1 Evaluation

### 3.2 Extensibility