

# INTRODUCTION TO PHYSICAL SCIENCE



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Introduction to Physical Science

Robert M Wagner

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## Licensing

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## CHAPTER OVERVIEW

### 1: What is Science?

#### Topic hierarchy

- [1.1: Lecture 1 - What is Science?](#)
- [1.2: Lecture 2 - Physical Quantities and Units](#)
- [1.3: Lecture 3 - Accuracy, Precision, and Significant Figures](#)

This lesson is based on Chapter 1 of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 1.1: Lecture 1 - What is Science?

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## 1.2: Lecture 2 - Physical Quantities and Units

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## CHAPTER OVERVIEW

### 2: Motion in One Dimension

#### Topic hierarchy

- [2.1: Lecture 1 - Vectors and Scalars](#)
- [2.2: Lecture 2 - Velocity and Acceleration](#)
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This lesson is based on Chapter 2 (2.1-2.7) and Chapter 4 (4.1-4.4) and Chapter 6 (6.5) of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 2.1: Lecture 1 - Vectors and Scalars

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## 2.2: Lecture 2 - Velocity and Acceleration

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## 2.3: Lecture 3 - Equations of Motion

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## 2.4: Lecture 4 - Falling Objects

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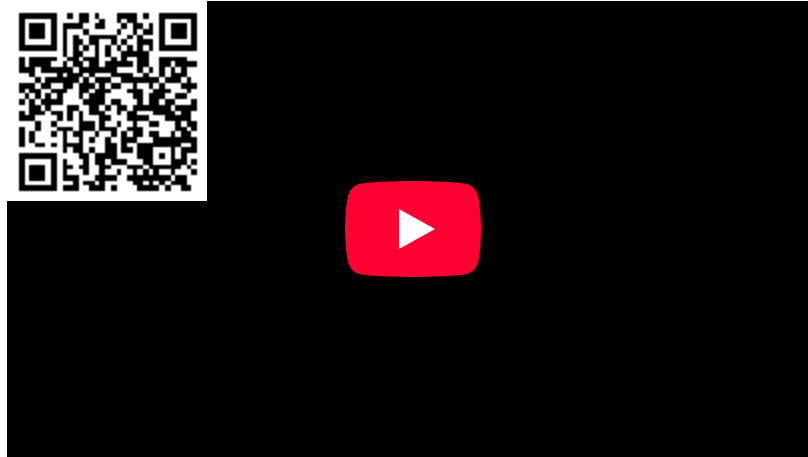


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## 2.5: Lecture 5 - Newton's Laws and Gravity

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## CHAPTER OVERVIEW

### 3: Work and Momentum

#### Topic hierarchy

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- [3.2: Lecture 2 - Potential Energy](#)
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- [3.5: Lecture 5 - Momentum and Impulse](#)
- [3.6: Lecture 6 - Conservation of Momentum](#)

This lesson is based on Chapter 7 (7.1-7.7) and Chapter 8 (8.1-8.4) of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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### 3.1: Lecture 1 - Work and Kinetic Energy

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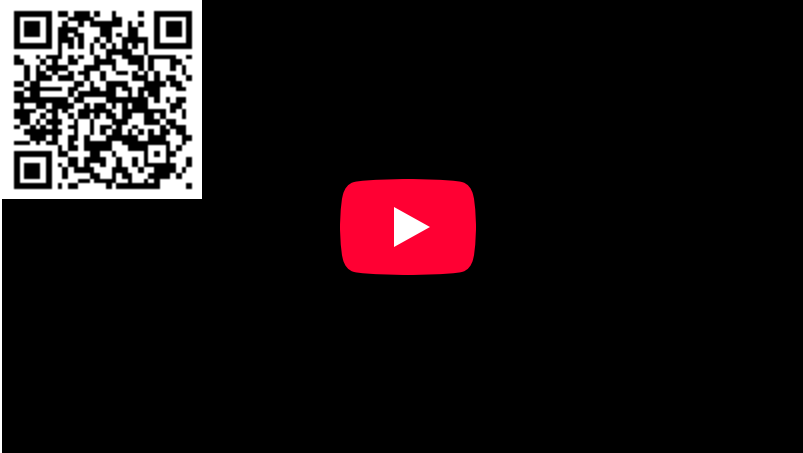


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## 3.2: Lecture 2 - Potential Energy

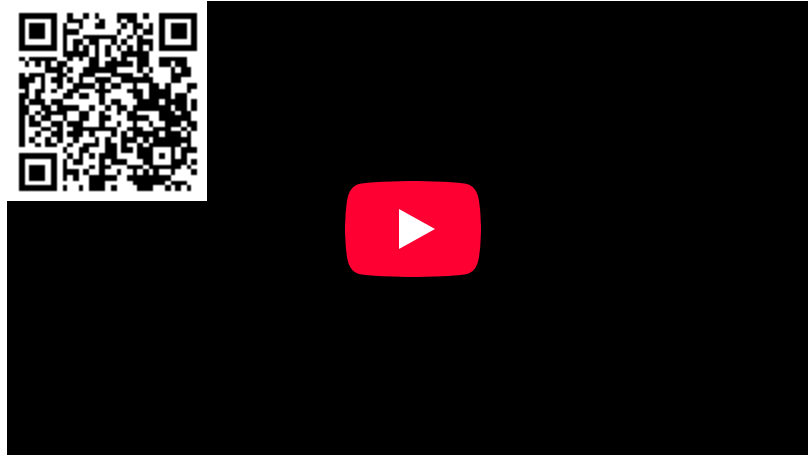
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### 3.3: Lecture 3 - Conservation of Energy

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### 3.4: Lecture 4 - Power

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### 3.5: Lecture 5 - Momentum and Impulse

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### 3.6: Lecture 6 - Conservation of Momentum

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## CHAPTER OVERVIEW

### 4: Heat

#### Topic hierarchy

- 4.1: Lecture 1 - Temperature
- 4.2: Lecture 2 - The Ideal Gas Law
- 4.3: Lecture 3 - Heat Capacity
- 4.4: Lecture 4 - Latent Heat
- 4.5: Lecture 5 - Heat Transfer
- 4.6: Lecture 6 - Thermodynamics

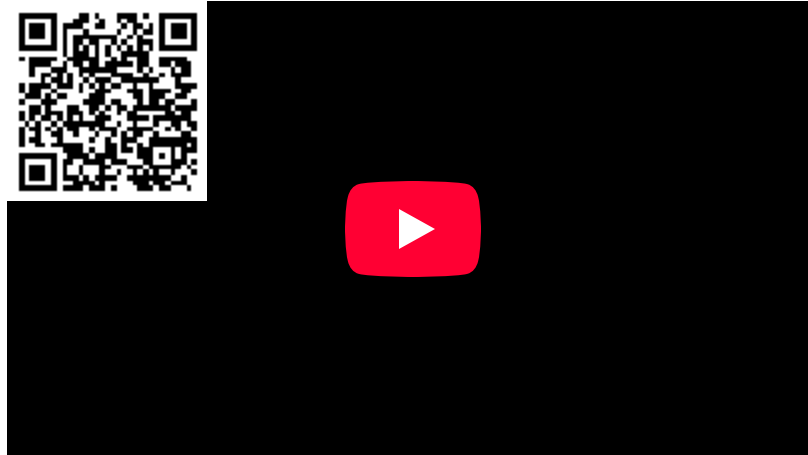
This lesson is based on Chapter 3 (13.1-13.3, & 13.5) and Chapter 14 (14.1-14.7) and Chapter 15 (15.1-15.3) of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 4.1: Lecture 1 - Temperature

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## 4.2: Lecture 2 - The Ideal Gas Law

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### 4.3: Lecture 3 - Heat Capacity

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## 4.4: Lecture 4 - Latent Heat

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## 4.5: Lecture 5 - Heat Transfer

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## 4.6: Lecture 6 - Thermodynamics

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## CHAPTER OVERVIEW

### 5: Oscillations and Waves

#### Topic hierarchy

- [5.1: Lecture 1 - Oscillations](#)
- [5.2: Lecture 2 - Simple Harmonic Motion](#)
- [5.3: Lecture 3 - Waves](#)
- [5.4: Lecture 4 - Sound](#)
- [5.5: Lecture 5 - Doppler Effect](#)

This lesson is based on Chapter 16 (16.1-16.4 & 16.8-16.10) and Chapter 17 (17.1-17.4) of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 5.1: Lecture 1 - Oscillations

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## 5.2: Lecture 2 - Simple Harmonic Motion

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## 5.3: Lecture 3 - Waves

The lesson is based on section 16.8-16.10 in the OpenStax College Physics textbook. The lecture slides are provided in [PowerPoint](#), [Keynote](#), and [PDF](#) format.



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## 5.4: Lecture 4 - Sound

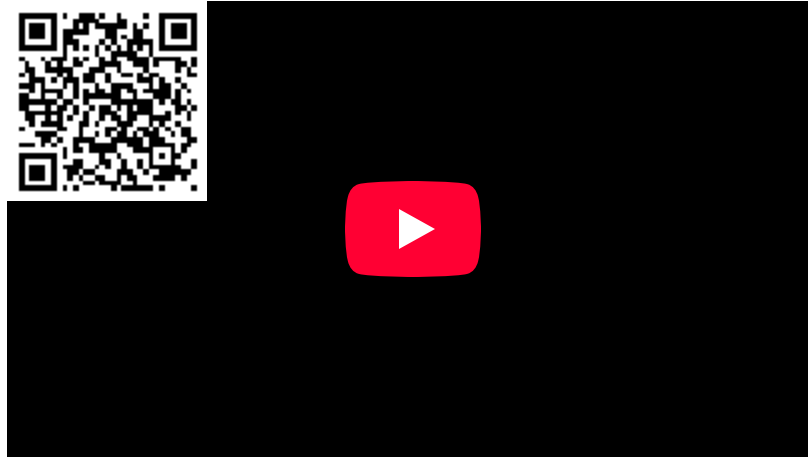
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## 5.5: Lecture 5 - Doppler Effect

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## CHAPTER OVERVIEW

### 6: Electricity and Magnetism

#### Topic hierarchy

- 6.1: Lecture 1 - Electric Fields and Coulomb's Law
- 6.2: Lecture 2 - Electric Current and Ohm's Law
- 6.3: Lecture 3 - Resistance and Electric Power
- 6.4: Lecture 4 - Electric Circuits
- 6.5: Lecture 5 - Kirchhoff's Rules
- 6.6: Lecture 6 - Magnetism

This lesson is based on Chapter 18 (18.1-18.3) and Chapter 19 (19.1) and Chapter 20 (20.1-20.4) and Chapter 21 (21.1 & 21.3) and Chapter 22 (22.1-22.3) of the OpenStax College Physics textbook.

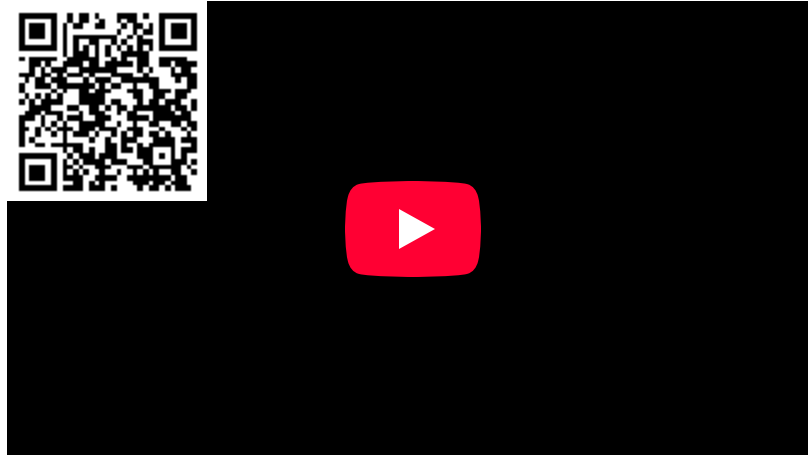
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## 6.1: Lecture 1 - Electric Fields and Coulomb's Law

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## 6.2: Lecture 2 - Electric Current and Ohm's Law

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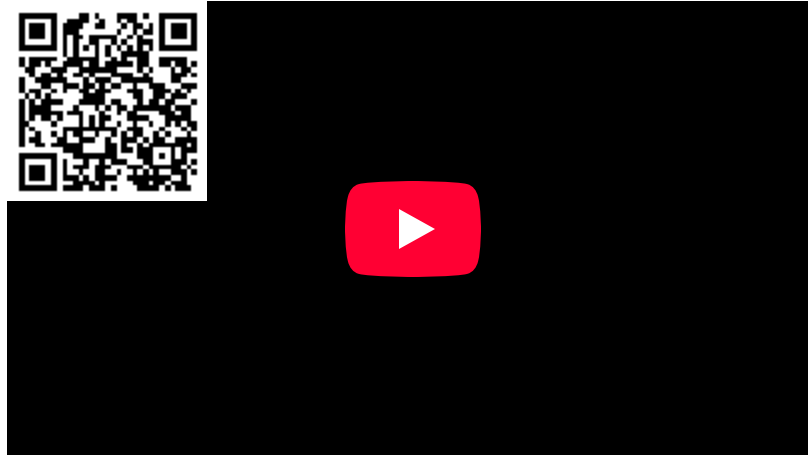
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## 6.3: Lecture 3 - Resistance and Electric Power

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## 6.4: Lecture 4 - Electric Circuits

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## 6.6: Lecture 6 - Magnetism

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## CHAPTER OVERVIEW

### 7: Electromagnetic Radiation

#### Topic hierarchy

- [7.1: Lecture 1 - Electromagnetic Waves](#)
- [7.2: Lecture 2 - Electromagnetic Spectrum](#)
- [7.3: Lecture 3 - Optics- Reflection and Refraction](#)
- [7.4: Lecture 4 - Image Formation- Lenses](#)
- [7.5: Image Formation- Mirrors](#)
- [7.6: Lecture 6 - Vision](#)
- [7.7: Lesson 7 - Microscopes and Telescopes](#)

This lesson is based on Chapter 24 (24.1-24.4) and Chapter 25 (25.1-25.6) and Chapter 26 (26.1-26.2 & 26.4-26.6) of the OpenStax College Physics textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

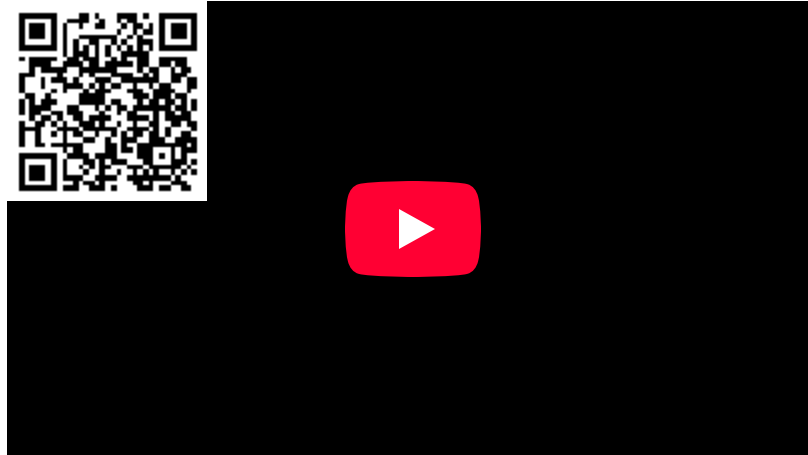
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## 7.1: Lecture 1 - Electromagnetic Waves

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## 7.2: Lecture 2 - Electromagnetic Spectrum

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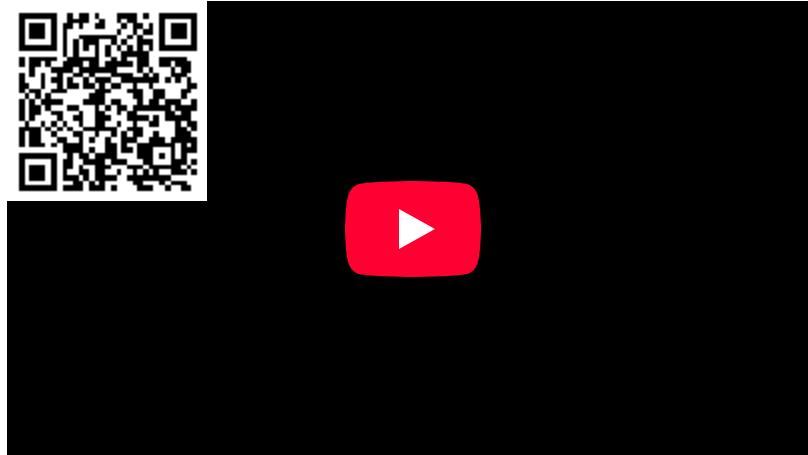
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## 7.3: Lecture 3 - Optics- Reflection and Refraction

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## 7.7: Lesson 7 - Microscopes and Telescopes

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## CHAPTER OVERVIEW

### 8: Midterm Exam

#### Topic hierarchy

##### [8.1: Lecture 1 - Midterm Exam](#)

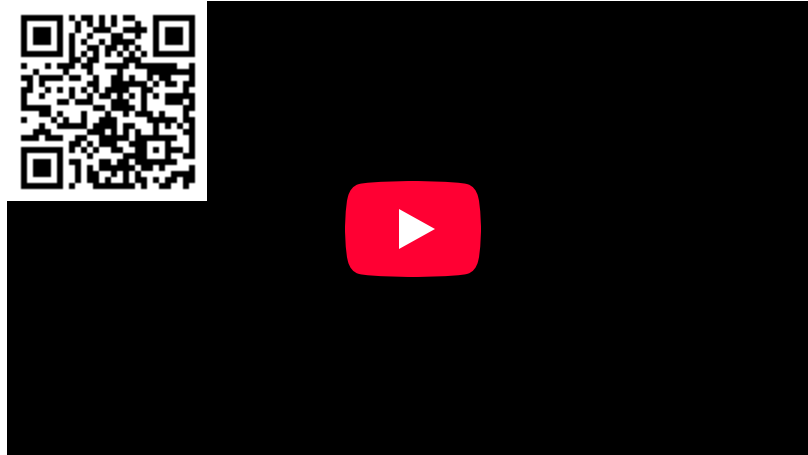
This lesson is a placeholder for the midterm exam to keep the numbering correct.

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## 8.1: Lecture 1 - Midterm Exam

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## CHAPTER OVERVIEW

### 9: Atoms and Periodic Properties

#### Topic hierarchy

9.1: Lecture 1 - Atomic Theory

9.2: Lecture 2 - Atomic Structure and Chemical Formulae

9.3: Lecture 3 - The Periodic Table

9.4: Lecture 4 - Compounds and Nomenclature

This lesson is based on Chapter 2 of the OpenStax Chemistry textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

---

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## 9.1: Lecture 1 - Atomic Theory

The lesson is based on section 2.1-2.2 in the OpenStax Chemistry 2e textbook. The lecture slides are provided in [PowerPoint](#), [Keynote](#), and [pdf](#) format.



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## 9.2: Lecture 2 - Atomic Structure and Chemical Formulae

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## 9.3: Lecture 3 - The Periodic Table

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## 9.4: Lecture 4 - Compounds and Nomenclature

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## CHAPTER OVERVIEW

### 10: Molarity and Chemical Equations

#### Topic hierarchy

[10.1: Lecture 1 - Formula Mass and the Mole Concept](#)

[10.2: Lecture 2 - Molarity](#)

[10.3: Lecture 3 - Balancing Chemical Equations](#)

[10.4: Lecture 4 - Classifying Chemical Reactions](#)

This lesson is based on Chapter 3 (3.1-3.3) and Chapter 4 (4.1-4.2) of the OpenStax Chemistry 2e textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 10.1: Lecture 1 - Formula Mass and the Mole Concept

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## 10.2: Lecture 2 - Molarity

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## 10.3: Lecture 3 - Balancing Chemical Equations

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## 10.4: Lecture 4 - Classifying Chemical Reactions

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## CHAPTER OVERVIEW

### 11: Models and Bonding

#### Topic hierarchy

- [11.1: Lecture 1 - Quantizations and the Bohr Model](#)
- [11.2: Lecture 2 - Quantum Theory](#)
- [11.3: Lecture 3 - Electron Configurations](#)
- [11.4: Lecture 4 - Ionic and Covalent Bonding](#)
- [11.5: Lecture 5 - Lewis Symbols](#)

This lesson is based on Chapter 6 (6.1-6.4) and Chapter 7 (7.1-7.3) of the OpenStax Chemistry 2e textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

---

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## 11.1: Lecture 1 - Quantizations and the Bohr Model

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## 11.2: Lecture 2 - Quantum Theory

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## 11.3: Lecture 3 - Electron Configurations

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The lesson is based on section 6.4 in the OpenStax Chemistry 2e textbook. The lecture slides are provided in [PowerPoint](#), [Keynote](#), and [pdf](#) format.



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## 11.4: Lecture 4 - Ionic and Covalent Bonding

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## 11.5: Lecture 5 - Lewis Symbols

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## CHAPTER OVERVIEW

### 12: Water and Solutions

#### Topic hierarchy

[12.1: Lecture 1 - Solutions](#)

[12.2: Lecture 2 - Solubility](#)

[12.3: Lecture 3 - Acids and Bases, pH](#)

[12.4: Lecture 4 - Strengths of Acids and Bases](#)

This lesson is based on Chapter 11 (11.1-11.3) and Chapter 14 (14.1-14.3) of the OpenStax Chemistry 2e textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 12.1: Lecture 1 - Solutions

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## 12.2: Lecture 2 - Solubility

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## 12.3: Lecture 3 - Acids and Bases, pH

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## 12.4: Lecture 4 - Strengths of Acids and Bases

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## CHAPTER OVERVIEW

### 13: Organic Compounds

#### Topic hierarchy

- [13.1: Lecture 1 - Hydrocarbons](#)
- [13.2: Lecture 2 - Alcohols and Ethers](#)
- [13.3: Lecture 3 - Aldehydes, Ketones, Carboxylic Acids, and Esthers](#)
- [13.4: Lecture 4 - Amines and Amides](#)

This lesson is based on Chapter 20 of the OpenStax Chemistry 2e textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 13.1: Lecture 1 - Hydrocarbons

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## 13.2: Lecture 2 - Alcohols and Ethers

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## 13.3: Lecture 3 - Aldehydes, Ketones, Carboxylic Acids, and Esthers

The lesson is based on section 20.3 in the OpenStax Chemistry 2e textbook. The lecture slides are provided in [PowerPoint](#), [Keynote](#), and [pdf](#) format.



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## 13.4: Lecture 4 - Amines and Amides

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## CHAPTER OVERVIEW

### 14: Nuclear Reactions

#### Topic hierarchy

[14.1: Lecture 1 - Nuclear Structure](#)

[14.2: Lecture 2 - Nuclear Equations](#)

[14.3: Lecture 3 - Radioactive Decay](#)

[14.4: Lecture 4 - Nuclear Energy](#)

This lesson is based on Chapter 21 (21.1-21.4) of the OpenStax Chemistry 2e textbook. Each section of the chapter will include my lecture slides as well as an embedded link to my YouTube video for that lecture.

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## 14.1: Lecture 1 - Nuclear Structure

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## 14.2: Lecture 2 - Nuclear Equations

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## 14.3: Lecture 3 - Radioactive Decay

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## 14.4: Lecture 4 - Nuclear Energy

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## Chapter 15 - Question Test Banks

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