

# Syllabus

## PLAR Prep – Physics Applied Pathway



**2 Units:** 10 lessons, 3 videos

**Estimated time:** 12-18 hours

**OALCF Levels:** A1.2, A1.3, A2.2, A2.3 A3

**Suggested Milestones:** 3, 4, 5, 6 or 7, 10, 11, 12 or 13, 14

### Course Overview

In this course, you will study electricity and optics. You will learn how to build electric circuits and analyze how light reflects or refracts on different surfaces.

### Unit 1: Electricity (6 lessons)

#### Electric Current

(24 slide tutorial and mastery test)

In this lesson, you will define conventional electric current and relate it to the direction of electron flow in a conductor and the potential difference across the circuit.

#### Electric Circuits

(33 slide tutorial and mastery test)

In this lesson, you will identify series and parallel circuits and explain how current flows through them.

#### AC and DC Current

(26 slide tutorial and mastery test)

In this lesson, you will study how alternating current (AC) and direct current (DC) both produce electricity, but differ in how they produce it.

#### Resistance and Ohm's Law

(27 slide tutorial and mastery test)

In this lesson, you will study resistance, calculate current and voltage for a resistor using Ohm's Law.

#### Circuit Diagrams

(24 slide tutorial and mastery test)

In this lesson, you will analyze circuit diagrams and describe how to measure voltage and current in a circuit.

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### **Series and Parallel Circuits**

(32 slide tutorial and mastery test)

In this lesson, you will study both series and parallel connections.

## **Unit 2: Optics (4 lessons, 3 videos)**

### **Interactions of Light with Matter**

(31 slide tutorial and mastery test)

In this lesson, you will use models to describe interactions of light and matter.

### **Reflection and Refraction of Light**

(33 slide tutorial and mastery test)

In this lesson, you will describe reflection and refraction, relating them to light.

### **Lenses**

(33 slide tutorial and mastery test)

In this lesson, you will interpret ray diagrams for concave and convex lenses.

### **Mirrors**

(33 slide tutorial and mastery test)

In this lesson, you will interpret ray diagrams for flat, concave, and convex mirrors.

### **Video: Convex and Concave Mirror Ray Diagrams**

(13:22 minutes)

In this video, you explore the ray tracing technique to figure out the properties of images when things are kept in front of a concave or a convex mirror.

### **Video: Concave Mirror Applications**

(8:36 minutes)

In this video, you will look at some applications of concave mirrors.

### **Video: Convex Mirrors and Applications**

(12:53 minutes)

In this video, you will learn about convex mirrors and their applications in your day to day life.