# Unit Ten - Radical Expressions and Equations

Content Area: **Mathematics**
Course(s): **Algebra 8**
Time Period: **May**
Length: **3 weeks**
Status: **Published**

## Transfer

**Big Idea: Radical Expression & Equations**

## Enduring Understandings

A single quantity may be represented by many different expressions.

Functions can be represented in a variety of ways, such as graphs, tables, equations, or words. Each representation is particularly useful in certain situations.

The numbers and types of solutions vary predictably, based on the type of equation.

## Essential Questions

How does knowing perfect squares help in simplifying radicals?

What similarities and differences exist between operations with radical expressions and operations with polynomials expressions?

## Critical Knowledge and Skills

## Vocabulary

**Vocabulary**

Extraneous Solution, Hypotenuse, Leg, Like Radicals, Pythagorean Theorem, Radical Expression, Radical Equation, Square Root Function, Unlike radicals

## Learning Objectives

Solve problems using Pythagorean Theorem (8.G.SRT.6,7,8)

Identify right triangles (8.G.SRT.6,7,8)

Simplify sums, differences, products and quotients of radical expressions (A.REI.2)

Solve equations containing radicals (A.REI.2)

Identify extraneous solutions (A.REI.2)

Graph and translate square root functions (F.IF.7.b)

## Resources

Khan Academy: Radical Relationships

NCTM Illuminations: What's the Point

3 Act Math: Taco Cart

## Standards

RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP11. Use technology to enhance productivity.

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.

9.1.8.C.5 Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages).

9.1.8.D.3 Differentiate among various investment options.

9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.

| | |
|---|---|
| MA.K-12.1 | Make sense of problems and persevere in solving them. |
| MA.K-12.4 | Model with mathematics. |
| MA.K-12.5 | Use appropriate tools strategically. |
| MA.F-IF.C | Analyze functions using different representations |
| MA.F-IF.C.7b | Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |
| MA.G-SRT.C | Define trigonometric ratios and solve problems involving right triangles |
| MA.G-SRT.C.6 | Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. |
| MA.G-SRT.C.7 | Explain and use the relationship between the sine and cosine of complementary angles. |
| MA.G-SRT.C.8 | Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. |
| MA.A-REI.A | Understand solving equations as a process of reasoning and explain the reasoning |
| MA.A-REI.A.2 | Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. |