# Unit 2: Exponents

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

## UNIT RATIONALE

In this unit, we will investigate Exponents and how they affect bases and exponents. Students will pair up to create interesting ways to represent these properties of exponents. This unit will be a foreshadowing to later on in the year, where we investigate exponential functions.

## ESSENTIAL QUESTIONS

What is an exponent?

What is a base?

How do we simplify exponential expressions?

Why do the properties work?

## STANDARDS

## NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

## New Jersey (NJSLS) - High School - Mathematics (2020)

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|---|---|
| MA.N-RN.A | Extend the properties of exponents to rational exponents. |
| MA.N-RN.A.1 | Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. |
| MA.N-RN.A.2 | Rewrite expressions involving radicals and rational exponents using the properties of exponents. |

## New Jersey Common Core - Grade 9-12 - Mathematics

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|---|---|
| MA.N-RN.A.1 | Explain how the definition of the meaning of rational exponents follows from extending |

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| | the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. |
| MA.N-RN.A.2 | Rewrite expressions involving radicals and rational exponents using the properties of exponents. |

## NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

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| 9.3.12.BM-MGT.8 | Create strategic plans used to manage business growth, profit and goals. |
| 12.9.3.HU-ED.4 | Create and maintain relationships between staff and parents/family members to encourage involvement and facilitate child development and learning. |
| 12.9.3.IT-PRG.10 | Design, create and maintain a database. |
| TECH.9.4.12.CT.2 | Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a). |
| TECH.9.4.12.TL.3 | Analyze the effectiveness of the process and quality of collaborative environments. |
| TECH.9.4.12.TL.4 | Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6). |

## NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

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| 9.3.12.AC-DES | Design/Pre-Construction |
| 9.3.12.AC-DES.1 | Justify design solutions through the use of research documentation and analysis of data. |
| 9.3.12.AC-DES.5 | Identify the diversity of needs, values and social patterns in project design, including accessibility standards. |
| 9.3.12.AR-AV.4 | Design an audio, video and/or film production. |
| 9.3.12.AR-VIS.2 | Analyze how the application of visual arts elements and principles of design communicate and express ideas. |
| 9.3.12.ED-TT.1 | Use foundational knowledge of subject matter to plan and prepare effective instruction and design courses or programs. |
| 12.9.3.12.TD-MTN.2 | Design ways to improve facility and equipment system performance. |
| 12.9.3.IT-NET.3 | Design a network system using technologies, tools and standards. |
| 12.9.3.IT-PRG.10 | Design, create and maintain a database. |
| 12.9.3.IT-WD.1 | Analyze customer requirements to design and develop a Web or digital communication product. |
| 12.9.3.IT-WD.2 | Apply the design and development process to produce user-focused Web and digital communications solutions. |
| 12.9.3.IT-WD.6 | Design, create and publish a digital communication product based on customer needs. |
| 12.9.3.ST-ET.1 | Use STEM concepts and processes to solve problems involving design and/or production. |
| 12.9.3.ST-ET.4 | Apply the elements of the design process. |

## PRE-ASSESSMENTS

Non-curricular tasks to identify students' readiness levels with problem solving.

Rubric Based Reassessments and Algebra 1 assignments.

## INSTRUCTIONAL PLAN

## MODULE 1

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| **Student Learning Intentions (SLI) WALT: (We are learning to…)** | We are learning to simplify the properties of exponents so we can evaluate exponential functions. |
| **Student Learning Strategies** | Interactive Notebooks<br>Practice Problems<br>Whiteboards |
| **Success Criteria** | I can determine the operation occurring while simplifying exponential expressions<br>I can use the correct property to simplify exponer expressions |
| **Formative Assessment (drives instructional decisions)** | There is no formative assessment for this introduction to exponential expressions |
| **Activities and Resources** | Interactive notebook page. |
| **Suggested Modifications** | The foldable can be filled out for students that ne it. |

Exponent_RulesGraphicOrganizer.docx

## MODULE 2

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| **Student Learning Intentions (SLI) WALT: (We are learning to…)** | We will develop exponent properties poster boar so we can practice simplifying exponents. |

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| **Student Learning Strategies** | Interactive Notebooks<br>Reference Sheets<br>Peer Collaboration |
| **Success Criteria** | We can create poster boards to practice simplifyi expressions.<br>I can develop a meme to relate to a specific exponent property<br>I can show an example with the work to relate to specific exponent property. |
| **Formative Assessment (drives instructional decisions)** | Rubric |
| **Activities and Resources** | Exponents Poster Project |
| **Suggested Modifications** | Students can use their interactive n notebooks ar reference sheets to develop the poster boards. |

ExponentLawsPosterProject.pdf

## REFLECTIONS

Students enjoyed this project.

## INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

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| LA.K-12.NJSLSA.R3 | Analyze how and why individuals, events, and ideas develop and interact over the course of a text. |
| LA.RI.9-10.2 | Determine a central idea of a text and analyze how it is developed and refined by specific details; provide an objective summary of the text. |
| LA.K-12.NJSLSA.W6 | Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. |
| LA.K-12.NJSLSA.SL1 | Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. |
| LA.W.9-10.2.B | Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. |

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| LA.W.9-10.5 | Develop and strengthen writing as needed by planning, revising, editing, rewriting, trying a new approach, or consulting a style manual (such as MLA or APA Style), focusing on addressing what is most significant for a specific purpose and audience. |
| LA.SL.9-10.1 | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. |
| LA.SL.9-10.1.B | Collaborate with peers to set rules for discussions (e.g., informal consensus, taking votes on key issues, presentation of alternate views); develop clear goals and assessment criteria (e.g., student developed rubric) and assign individual roles as needed. |
| LA.SL.9-10.4 | Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. |