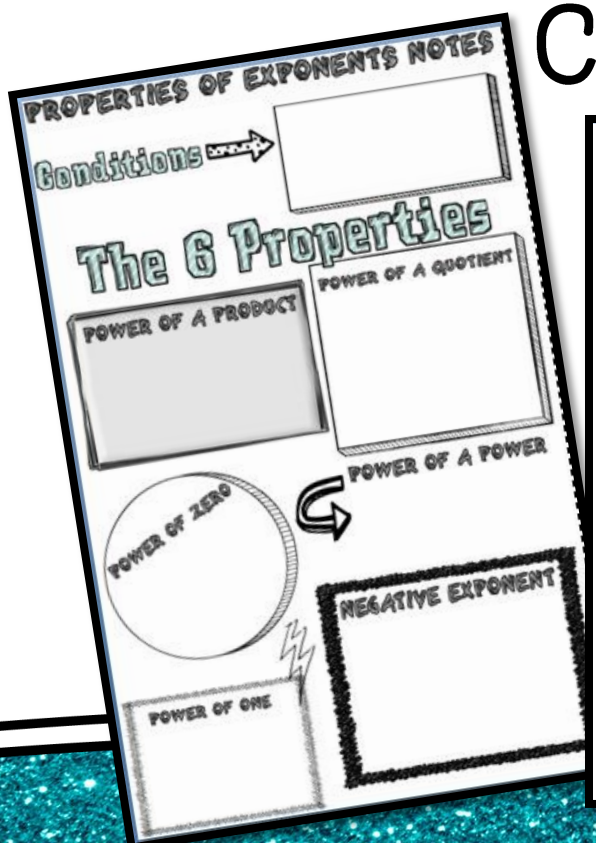
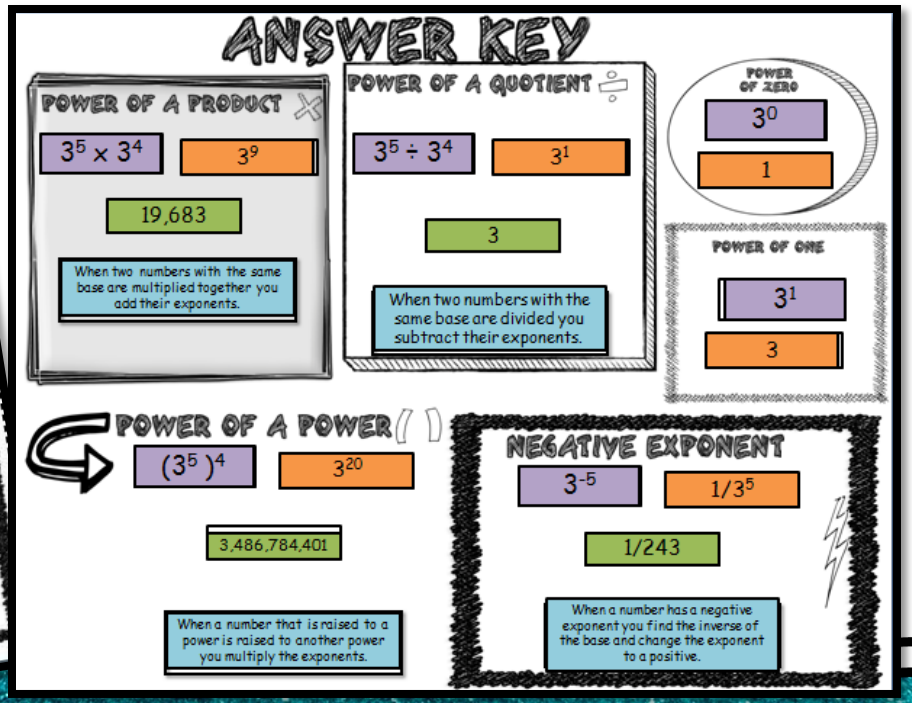
PROPERTY OF EXPONENTS

DISCOVERY LAB & NOTES

CCSS 8.EE.A.1





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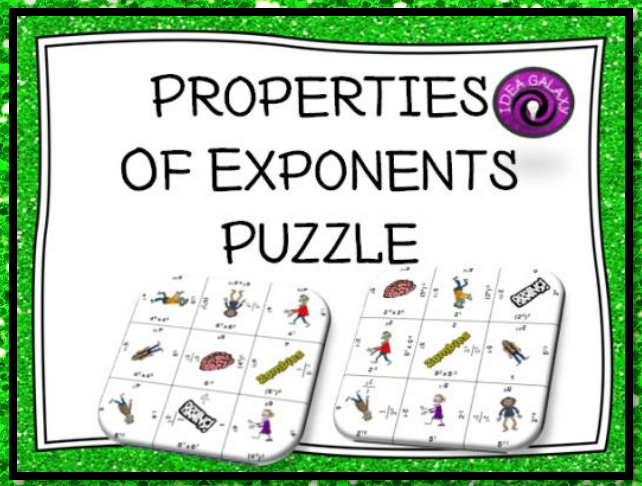

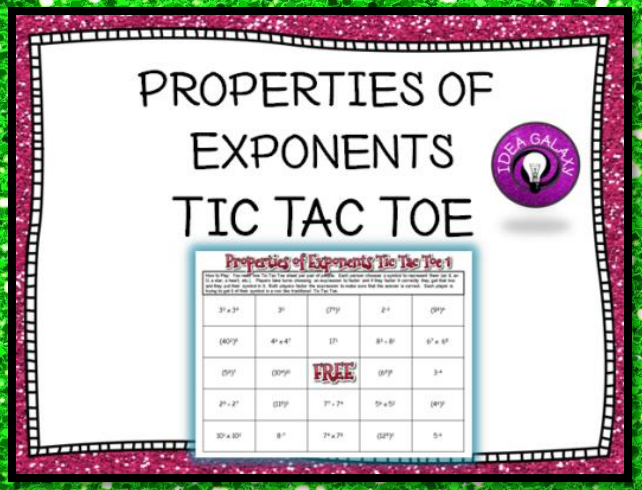

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Teacher Directions:

This resource includes a discovery lab component and student notes that can be added to an interactive notebook. The discovery lab has two pages to be printed for students- the Partner Sheet and the Cut-Outs. The Partner Sheet has the 6 properties of exponents on it with blank spaces. The Cut-Outs sheet has examples, equivalents, simplified forms, and rules which will be cut apart and sorted onto the Partner Sheet in the corresponding space of the right property. There are directions for students on the page where they cut out the different parts. The second portion, the student notes, has the student notes page included on the PDF for printing, and a separate PowerPoint document for the teacher's use.

Steps for use:

1) Have students sort the examples, equivalents, simplified forms & rules onto the Partner Sheet.
2) Ask students to justify why they placed items where they did.
3) Review answers as a whole class.
4) Distribute student notes page to students (half page). Using the teacher PowerPoint, review the six rules while students take notes.

About this Resource:

This resource is a discovery-based introduction to 6 properties of exponents including the power of a product, power or a power, power of a quotient, negative power, power of zero, and power of one.

Includes
-Property of exponents lab for students to complete with a partner.
-Notes to be included in an interactive notebook.
-Animated instructions for completing the notes.

Tips and Variations :

-There is a fill-in the blank version of the notes for students with IEPS, ELL students, or other students who may need that modification.
-Let the students struggle during the Discovery Lab portion of the activity and don't given them too many hints.

PROPERTIES OF EXPONENTS DISCOVERY LAB-PARTNER SHEET

POWER OF A PRODUCT

example

equivalent

simplified

Rule:

POWER OF A QUOTIENT

example

equivalent

simplified

Rule:

POWER OF ZERO

example

equivalent

Rule:

POWER OF ONE

example

equivalent

Rule:

POWER OF A POWER

example

equivalent

simplified

Rule:

NEGATIVE EXPONENT

example

equivalent

simplified

Rule:

DISCOVERY LAB CUT-OUTS

Directions: First, cut out the 6 "example" and then place them on the Discovery Lab paper on the example space for the correct property. Next, cut out the 6 "equivalent" and place them on the correct space for each property of exponents. Do the same thing with the "simplified" and the "rule". Be ready to justify your choices.

example
$3^5 \times 3^4$
3^{-5}
$3^5 \div 3^4$
$(3^5)^4$
3^1
3^0

simplified
19,683
1/243
3
3,486,784,401

equivalent
3
3^{20}
3^1
$1/3^5$
1
3^9

Rule:

Any number raised to a power of 0 will equal 1.
Any number raised to a power of 1 will equal the base.
When a number that is raised to a power is raised to another power you multiply the exponents.
When a number has a negative exponent you find the inverse of the base and change the exponent to a positive.
When two numbers with the same base are divided you subtract their exponents.
When two numbers with the same base are multiplied together you add their exponents.

DISCOVERY LAB CUT-OUTS

Directions: First, cut out the 6 "example" and then place them on the Discovery Lab paper on the example space for the correct property. Next, cut out the 6 "equivalent" and place them on the correct space for each property of exponents. Do the same thing with the "simplified" and the "rule". Be ready to justify your choices.

example
$3^5 \times 3^4$
3^{-5}
$3^5 \div 3^4$
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equivalent
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3^{20}
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Rule:

Any number raised to a power of 0 will equal 1.
Any number raised to a power of 1 will equal the base.
When a number that is raised to a power is raised to another power you multiply the exponents.
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When two numbers with the same base are divided you subtract their exponents.
When two numbers with the same base are multiplied together you add their exponents.

ANSWER KEY

POWER OF A PRODUCT

$3^5 \times 3^4$

3^9

19,683

When two numbers with the same base are multiplied together you add their exponents.

POWER OF A QUOTIENT

$3^5 \div 3^4$

3^1

3

When two numbers with the same base are divided you subtract their exponents.

POWER OF ZERO

3^0

1

Any number raised to a power of 0 will equal 1.

POWER OF ONE

3^1

3

Any number raised to a power of 1 will equal the base.

POWER OF A POWER

$(3^5)^4$

3^{20}

3,486,784,401

When a number that is raised to a power is raised to another power you multiply the exponents.

NEGATIVE EXPONENT

3^{-5}

$1/3^5$

1/243

When a number has a negative exponent you find the inverse of the base and change the exponent to a positive.

PROPERTIES OF EXPONENTS NOTES

Conditions →

The 6 Properties

POWER OF A PRODUCT

POWER OF A QUOTIENT

POWER OF A POWER

POWER OF ZERO

NEGATIVE EXPONENT

POWER OF ONE

PROPERTIES OF EXPONENTS NOTES

Conditions →

The 6 Properties

POWER OF A PRODUCT

POWER OF A QUOTIENT

POWER OF A POWER

POWER OF ZERO

NEGATIVE EXPONENT

POWER OF ONE

PROPERTIES OF EXPONENTS NOTES

Conditions →

These _____ are for powers of integers with the same _____.

The 6 Properties

POWER OF A PRODUCT

When two numbers with the same _____ are multiplied together you _____ their _____.

POWER OF A QUOTIENT

When two numbers with the _____ base are _____ you _____ their exponents.

POWER OF A POWER

When a number that is _____ to a power is raised to another _____ you _____ the _____.

POWER OF ZERO

Any number raised to a power of 0 will equal 1.

NEGATIVE EXPONENT

When a number has a _____ exponent you find the _____ of the base and change the exponent to a _____.

POWER OF ONE

Any number raised to a power of 1 will equal the base.

PROPERTIES OF EXPONENTS NOTES

Conditions →

These _____ are for powers of integers with the same _____.

The 6 Properties

POWER OF A PRODUCT

When two numbers with the same _____ are multiplied together you _____ their _____.

POWER OF A QUOTIENT

When two numbers with the _____ base are _____ you _____ their exponents.

POWER OF A POWER

When a number that is _____ to a power is raised to another _____ you _____ the _____.

POWER OF ZERO

Any number raised to a power of 0 will equal 1.

NEGATIVE EXPONENT

When a number has a _____ exponent you find the _____ of the base and change the exponent to a _____.

POWER OF ONE

Any number raised to a power of 1 will equal the base.