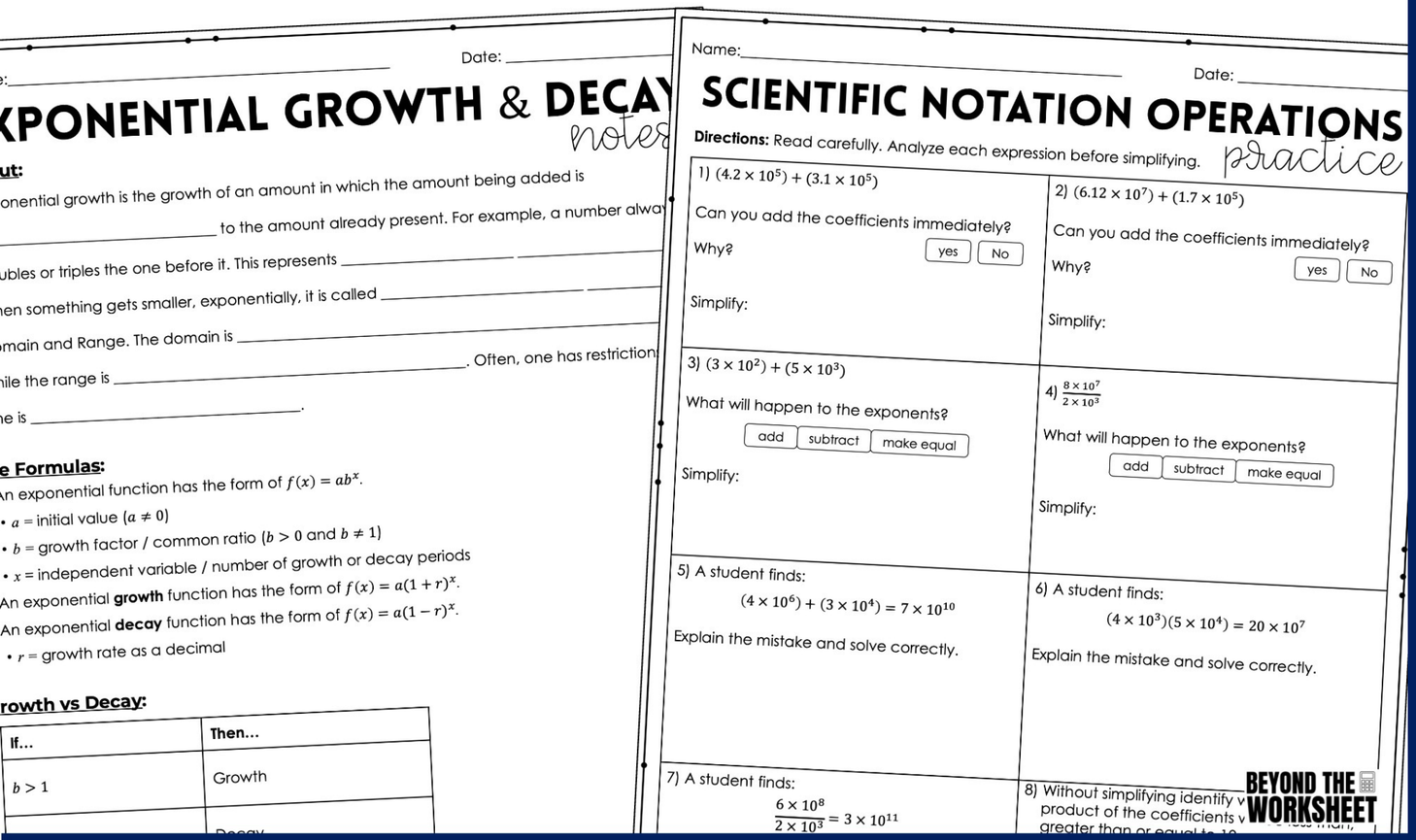
ALGEBRA 1 CURRICULUM – UNIT 7

EXPONENTIAL FUNCTIONS



Date: _____

XPONENTIAL GROWTH & DECAY *notes*

ut:

onential growth is the growth of an amount in which the amount being added is

_____ to the amount already present. For example, a number alwa

ubles or triples the one before it. This represents _____

hen something gets smaller, exponentially, it is called _____

omain and Range. The domain is _____

hile the range is _____. Often, one has restriction

he is _____.

e Formulas:

An exponential function has the form of $f(x) = ab^x$.

- a = initial value ($a \neq 0$)
- b = growth factor / common ratio ($b > 0$ and $b \neq 1$)
- x = independent variable / number of growth or decay periods

An exponential **growth** function has the form of $f(x) = a(1+r)^x$.

An exponential **decay** function has the form of $f(x) = a(1-r)^x$.

- r = growth rate as a decimal

rowth vs Decay:

If...	Then...
$b > 1$	Growth
	Decay

Name: _____ Date: _____

SCIENTIFIC NOTATION OPERATIONS *practice*

Directions: Read carefully. Analyze each expression before simplifying.

1) $(4.2 \times 10^5) + (3.1 \times 10^5)$

Can you add the coefficients immediately?

Why? yes No

Simplify:

2) $(6.12 \times 10^7) + (1.7 \times 10^5)$

Can you add the coefficients immediately?

Why? yes No

Simplify:

3) $(3 \times 10^2) + (5 \times 10^3)$

What will happen to the exponents?

add subtract make equal

Simplify:

4) $\frac{8 \times 10^7}{2 \times 10^3}$

What will happen to the exponents?

add subtract make equal

Simplify:

5) A student finds:

$(4 \times 10^6) + (3 \times 10^4) = 7 \times 10^{10}$

Explain the mistake and solve correctly.

6) A student finds:

$(4 \times 10^3)(5 \times 10^4) = 20 \times 10^7$

Explain the mistake and solve correctly.

7) A student finds:

$\frac{6 \times 10^8}{2 \times 10^3} = 3 \times 10^{11}$

8) Without simplifying identify v
product of the coefficients v
greater than or equal to 10

BEYOND THE WORKSHEET

GUIDED NOTES, PRACTICE, ACTIVITIES, ASSESSMENTS AND MORE!

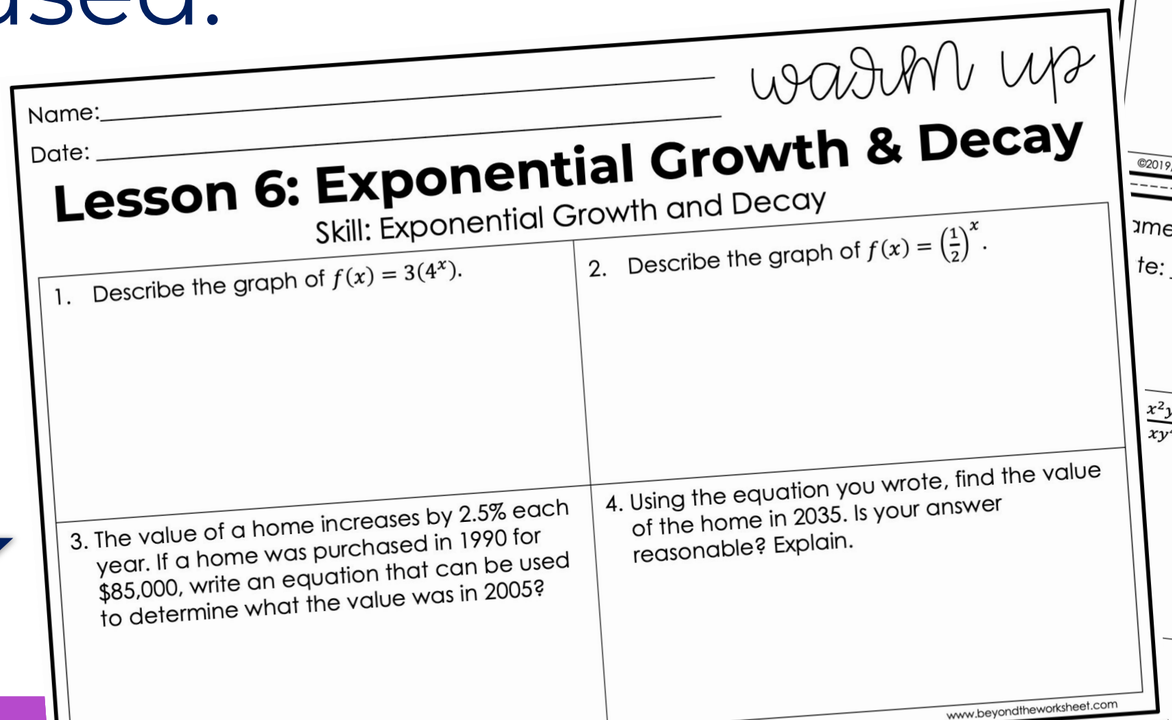
This ready-to-use resource includes guided notes, practice worksheets, warm-ups, exit tickets, quizzes, assessments, and engaging supplemental activities to support approximately **16 days of instruction**.

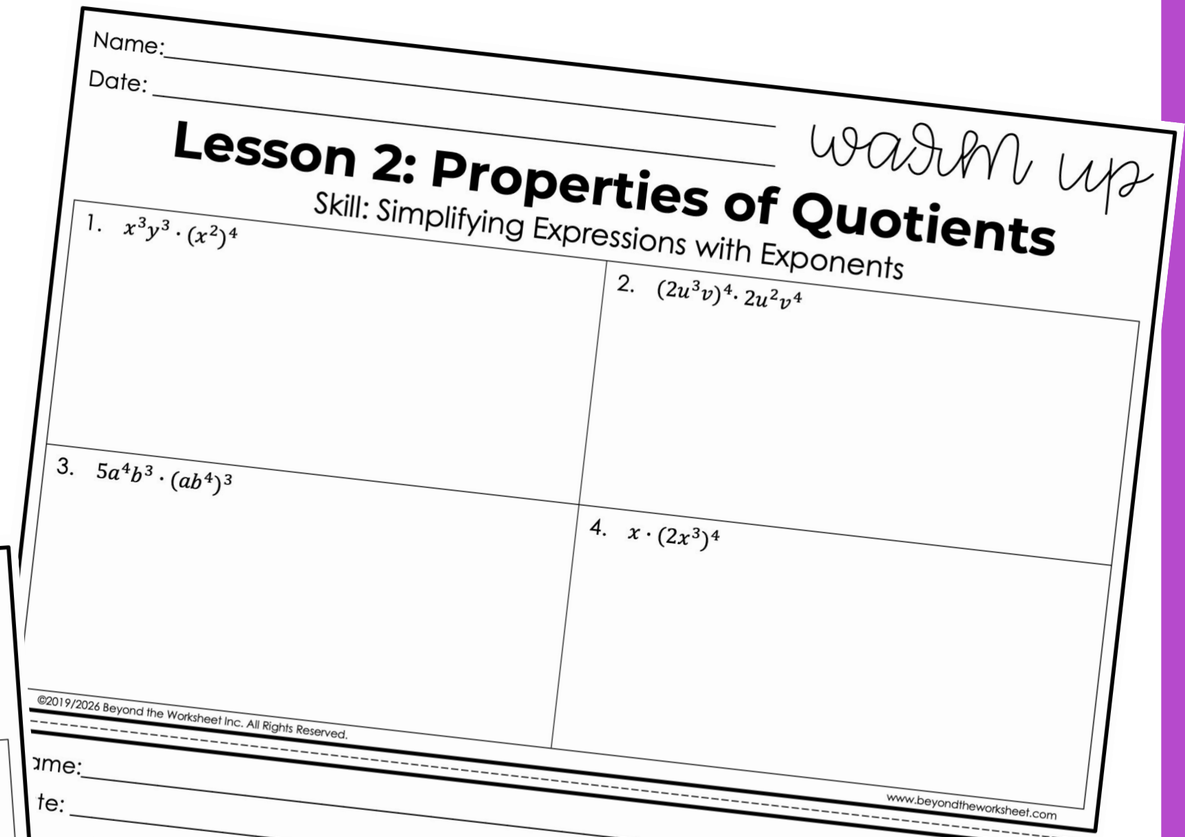
learn more!

WARM-UPS & EXIT TICKETS

- Structured and spiraled daily warm-up exercises and exercises keep students engaged and focused.



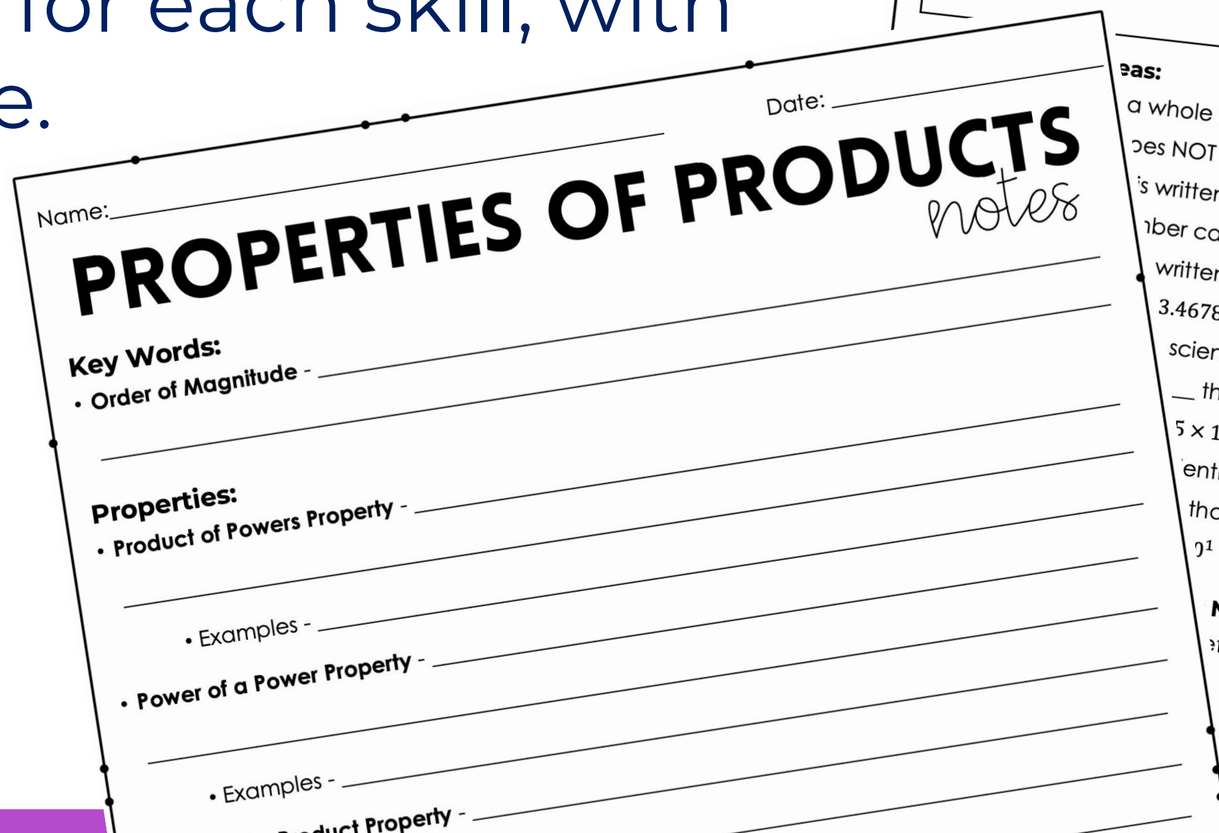

Name:
Date:
warm up
Lesson 6: Exponential Growth & Decay
Skill: Exponential Growth and Decay
1. Describe the graph of $f(x) = 3(4^x)$.
2. Describe the graph of $f(x) = \left(\frac{1}{2}\right)^x$.
3. The value of a home increases by 2.5% each year. If a home was purchased in 1990 for $85,000, write an equation that can be used to determine what the value was in 2005?
4. Using the equation you wrote, find the value of the home in 2035. Is your answer reasonable? Explain.
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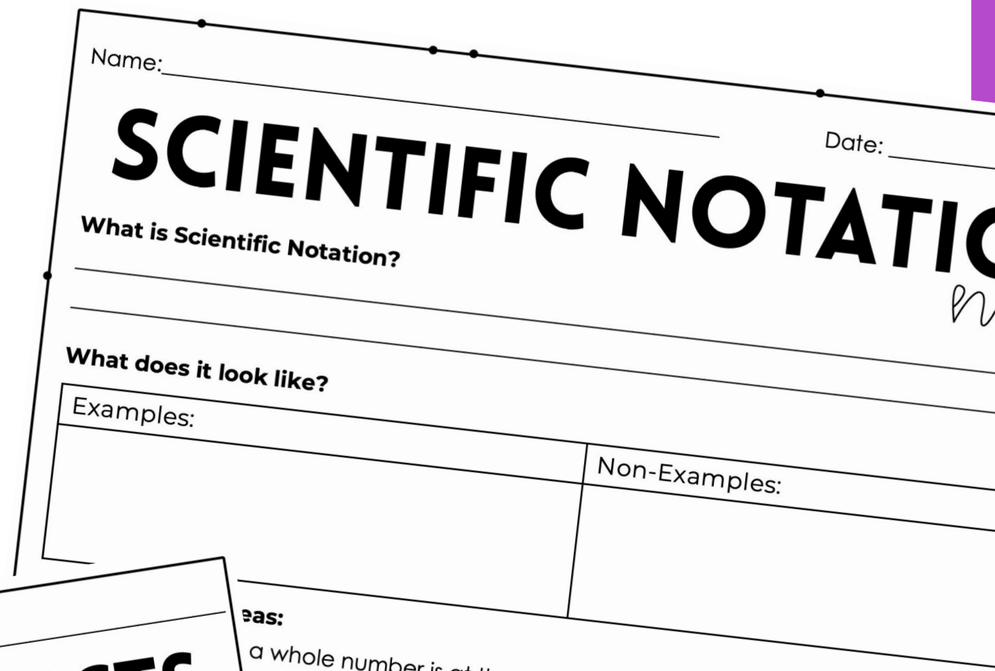

Name:
Date:
warm up
Lesson 2: Properties of Quotients
Skill: Simplifying Expressions with Exponents
1. $x^3y^3 \cdot (x^2)^4$
2. $(2u^3v)^4 \cdot 2u^2v^4$
3. $5a^4b^3 \cdot (ab^4)^3$
4. $x \cdot (2x^3)^4$
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ame:
te:
warm up
Lesson 2: Properties of Quotients
Skill: Simplifying Expressions with Exponents
$\frac{x^2y^6}{xy^4}$
2. $\frac{m^3}{3mn^2y^4}$
4. $\frac{k^{12}m^6}{}$

STUDENT FRIENDLY NOTES

- This unit covers exponent rules, scientific notation, and exponential growth and decay.
- The notes give students a place to learn the steps for each skill, with guided practice.


Name:
PROPERTIES OF PRODUCTS notes
Date:
Key Words:
• Order of Magnitude -
Properties:
• Product of Powers Property -
• Examples -
• Power of a Power Property -
• Examples -


Name:
Date:
SCIENTIFIC NOTATIO
What is Scientific Notation?
What does it look like?
Examples:
Non-Examples:
a whole number is at the ____ of the number.
oes NOT represent the number of ____.
's written in scientific notation there is only ____ number in front
ber cannot be ____.
written in proper scientific notation?
3.4678×10^3 0.34678×10^4 14.678×10^3
scientific notation has a ____ exponent, it means t
__ than 1.
5×10^{-1} $0.00056 = 5.6 \times 10^{-4}$
entific notation has a ____ exponent, it means th
than 1.
0^1 $56{,}000 = 5.6 \times 10^4$
Notation
ft or right until there is ____ ____ in front of
the decimal was moved. This will be your ____
ed right, the exponent will be ____
d left, the exponent will

PRACTICE WORKSHEETS

- Each skill includes a worksheet for independent practice and skill reinforcement.

Name: _____ Date: _____

ZERO & NEGATIVE EXPONENTS *practice*

Directions: For each expression, decide what you know before simplifying. Explain your reasoning, then simplify completely. Write all answers with positive exponents.

1) 7^0

What does the exponent tell you?

Simplified: _____

2) x^{-4}

What does the exponent tell you?

Simplified: _____

3) $\frac{1}{m^{-3}}$

Will m end up in the numerator or denominator? Why?

Simplified: _____

4) $(3x^{-2})^2$

Which property should you use first? Why?

Simplified: _____

6) $\frac{a^{-2}b^5}{a^3b^{-1}}$

Name: _____ Date: _____

COMPOUND INTER *pra*

Directions: Read each situation carefully. Show your work.

1. $5,400 is invested in a savings account with a fixed annual interest rate of 5% compounded twice a year. What will be the balance in the account after 6 months?

2. $2,133 is invested in a savings ac fixed annual interest rate of 9% compounded annually. What wi balance in the account after 15

m invests money in a retirement account h a fixed annual interest rate of 2.45% npounded 3 times per year. After 6 years ccount balance is $25,675.42. How h did he originally invest?

4. Naomi invests money in a savings ac There is a fixed annual interest rate c compounded monthly. After 10 yea balance is $14,654.92. How much did originally invest?

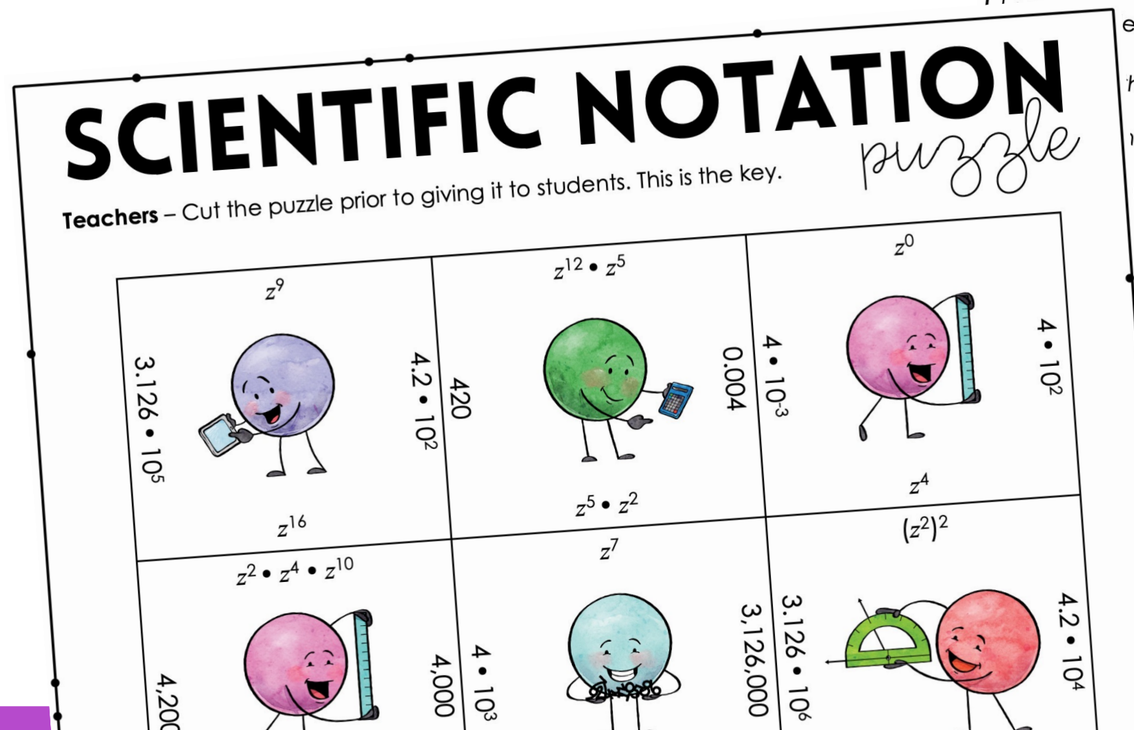
invests $4,650 in a retirement t that earns 6% annual interest nded quarterly. What will the of the account be after 20 years?

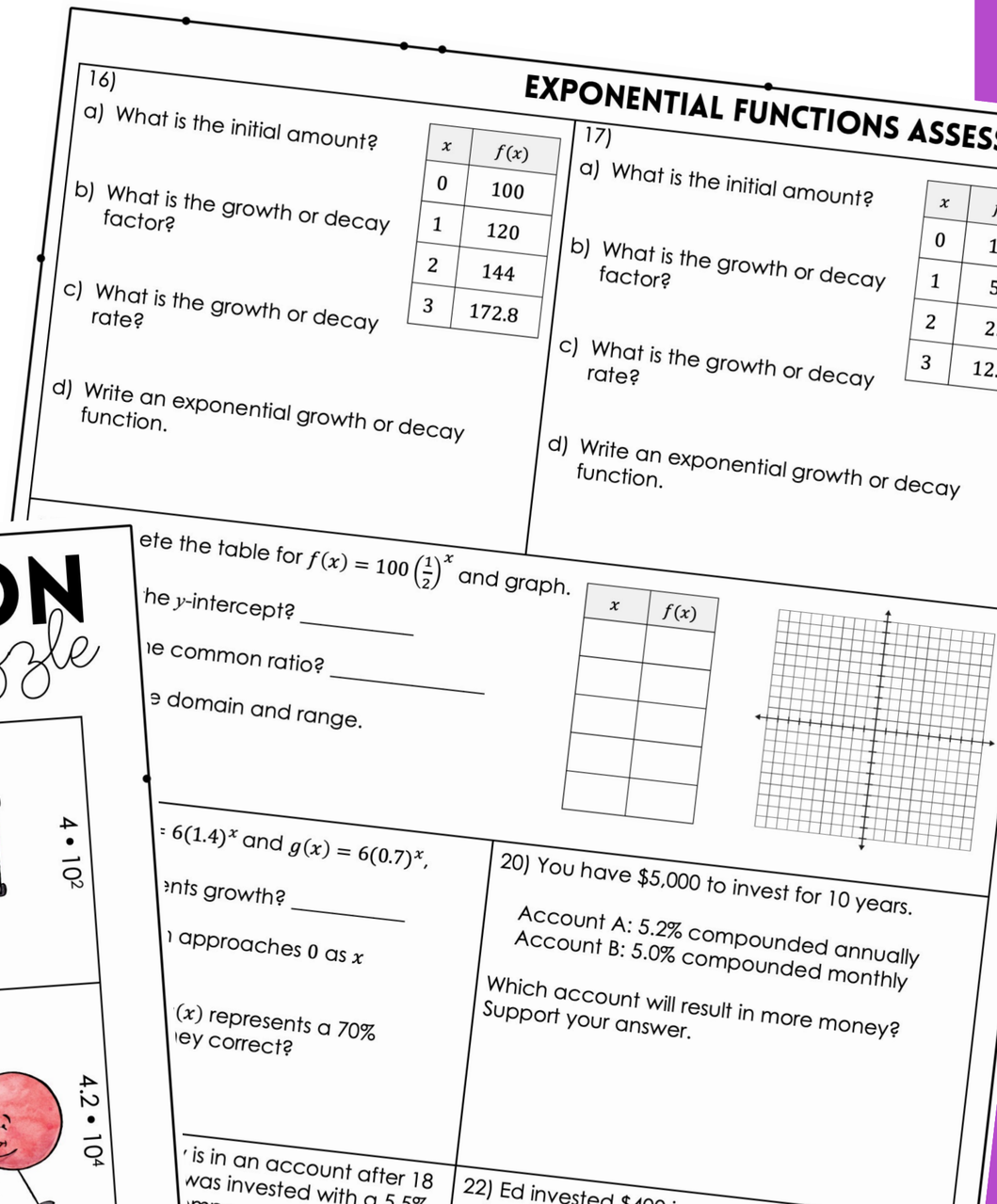
6. Find the total value of a $17,430 investm put into an account for 3 years with a interest rate that is compounded annu

0,000 to invest for 10 years. Account A earns 8% compounded monthly. Accoun npounded annually. Without calculating, predict which you think will earn more math to check your prediction.

ACTIVITIES AND ASSESSMENTS

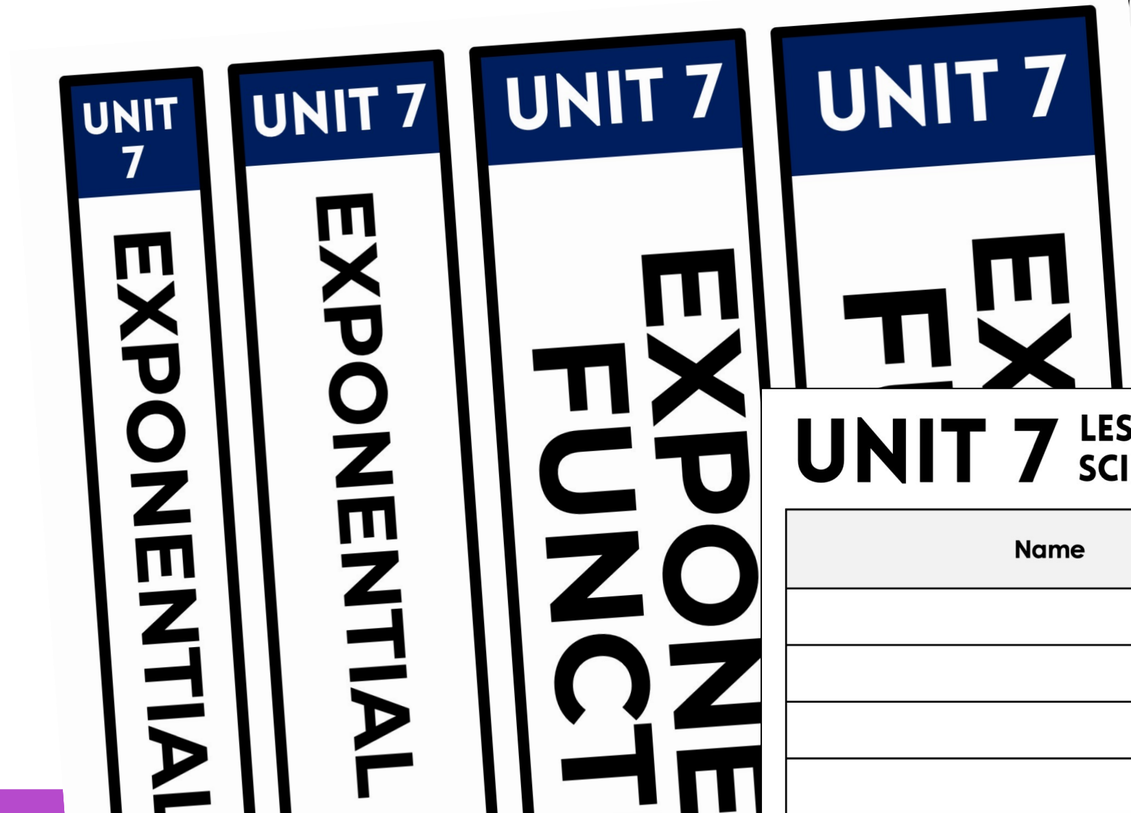
- Each lesson includes an activity such as a maze, coloring pages, etc.
- Pre and Post-Assessments are included along with quizzes.

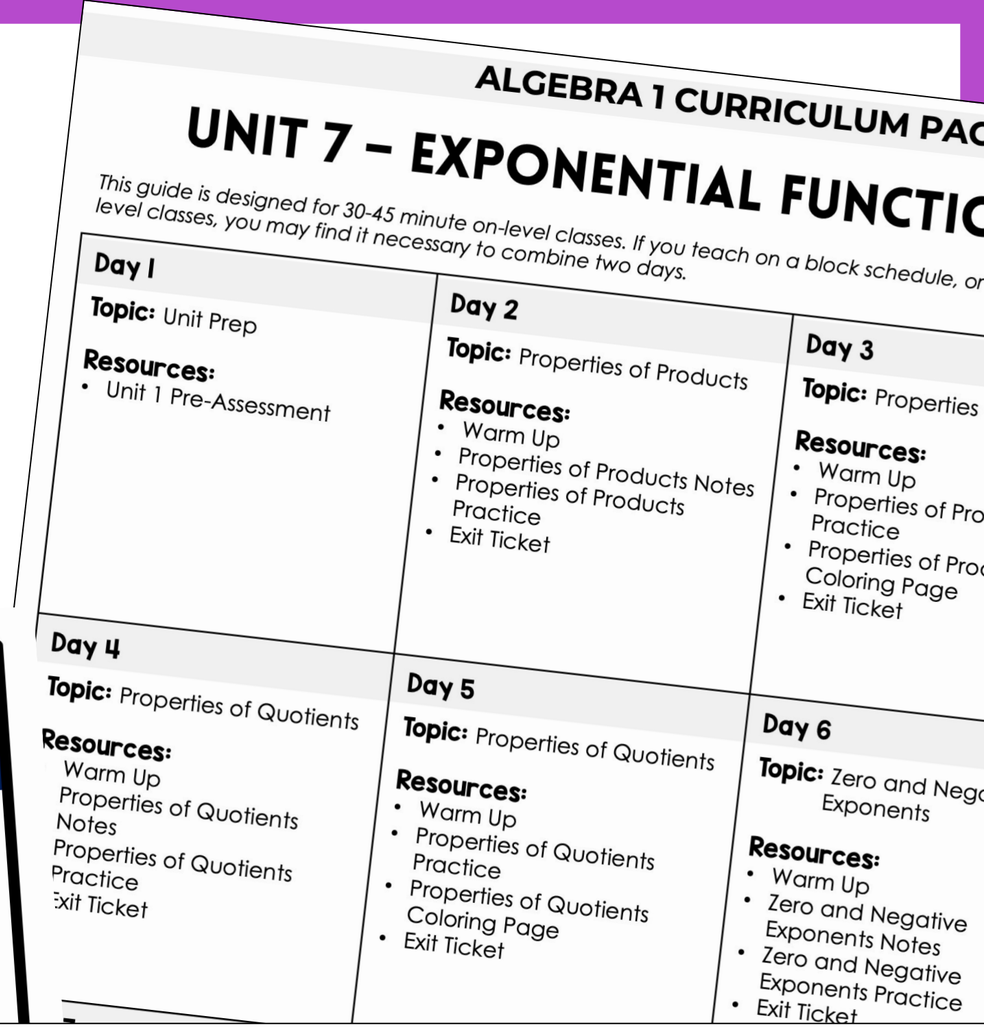


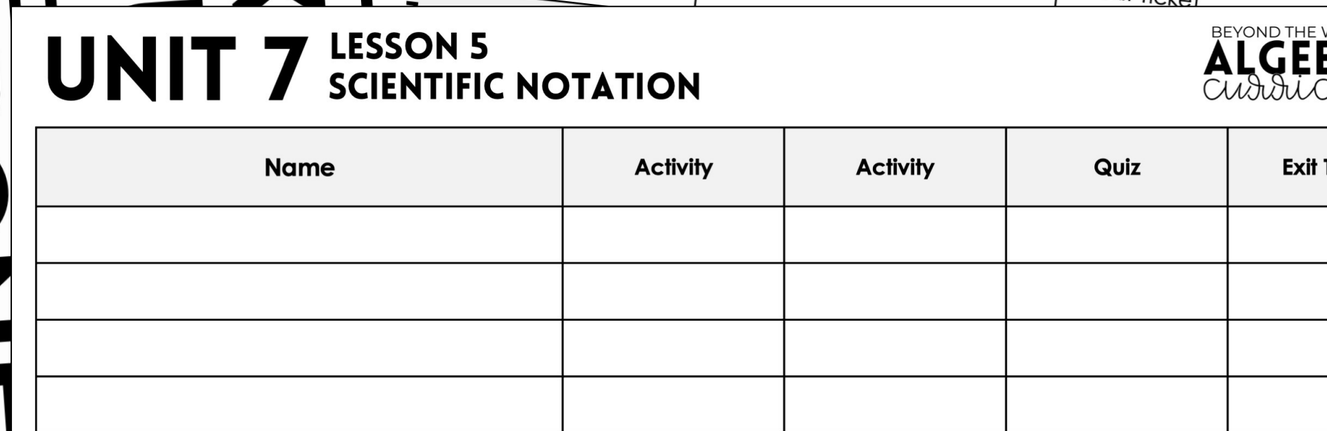


TEACHER RESOURCES

- Pacing guide
- Tracking pages
- Lesson info sheets
- Binder covers and spine labels







EVERYTHING INCLUDED:

- Lessons are designed for 30-45 minute on-level classes and may need to be adjusted for longer classes or varied levels.
- Also includes an answer key and editable version.

UNIT 7

ALGEBRA 1 curriculum
BEYOND THE WORKSHEET

Exponential Functions

Lesson	Resources
Unit Prep (pgs. 4 – 11)	• Weekly Warm Up Sheet • Exit Tickets • Lesson Plan Template • Vocabulary Sheets • Pre-Assessment
(1) Properties of Products (pgs. 12 – 17)	• Two Warm Ups • Exponents Involving Products Notes • Whole Group Practice • Exponents Involving Products Practice Worksheets • Two Exit Tickets • Supplemental Activities in Folder • Exponents Involving Products Coloring Worksheet
(2) Properties of Quotients (pgs. 18 – 23)	• Two Warm Ups • Exponents Involving Quotients Notes • Whole Group Practice • Exponents Involving Quotients Practice Worksheets • Two Exit Tickets • Supplemental Activities in Folder • Exponents Involving Quotients Coloring Worksheet
(3) Zero and Negative Exponents (pgs. 24 – 29)	• Two Warm Ups • Zero and Negative Exponents Notes • Whole Group Practice • Zero and Negative Exponents Practice • Two Exit Tickets • Supplemental Activities in Folder • Zero and Negative Exponents Riddle Worksheet
(4) Exponent Rules Review & Quiz (pgs. 30 – 34)	• One Warm Up • Review Rules of Exponents • Rules of Exponents Quiz

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- Also includes an answer key and editable version.

UNIT 7

ALGEBRA 1 curriculum
BEYOND THE WORKSHEET

Exponential Functions	
Lesson	**Resources**

(5) Scientific Notation (pgs. 35 – 44)	• Three Warm Ups
	• Scientific Notation Review Notes
	• Exponents and Scientific Notation puzzle
	• Operations with Scientific Notation Notes
	• Operations with Scientific Notation Whole Group Practice
	• Operations with Scientific Notation Independent Practice
	• Scientific Notation Quiz
	• Two Exit Tickets
	• Supplemental Activities in Folder
	  • Scientific Notation Riddle
	  • Scientific Notation Coloring Page
	  • Scientific Notation Matching Activity

(6) Exponential Growth and Decay Functions (pgs. 45 – 55)	• Three Warm Ups • Exponential Growth and Decay Notes • Exponential Growth and Decay Practice – 2 pages • Compound Interest Notes • Compound Interest Practice Worksheet • Three Exit Tickets • Supplemental Activities in Folder • Compound Interest Scavenger Hunt
End of Unit (pgs. 56 – 60)	• Study Guide • Unit Exam

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Have questions?

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