6.NS.8: Evaluate positive rational numbers with whole number exponents.	
Reporting Category: Number Sense	**Subdomain**: Integers and Rational Numbers
6.NS.8 Instructional Framework	
Assessed On: ☐ Checkpoint 1 ☐ Checkpoint 2 ☐ Checkpoint 3 ☑ Summative	
Content Limits: • Include rational numbers • Do not include muti-term expressions (example: $56 \bullet 2^4$)	
Clarifications: • The keypad in the ILEARN testing system does not allow students to enter a comma between each period in a multi-digit number. (Example: 13,323 would be entered as 13323.)	
Calculator Availability: Not allowed	
Expected Academic Vocabulary: base, exponent, expression, factor	
Examples of Context at Varying Difficulty Levels	
Easy	Base as a whole number or no computation required.
Medium	Base as a fraction.
Difficult	Base as a decimal.
Proficiency Level Descriptors and Example Items	
Looking Back: 5.NS.3 ILEARN Item Specification	**Looking Ahead**: 7.NS.6 ILEARN Item Specification
Below Proficiency: Determine the relationship between the base and exponent in an exponential expression.	
In the expression 7^4, 7 is the base and 4 is the exponent. Select the statement that provides an equivalent expression and justification for 5^3. a. $7 \bullet 7 \bullet 7 \bullet 7$ because the base tells you the number of times the exponent is used as a factor **b.** $7 \bullet 7 \bullet 7 \bullet 7$ because the exponent tells you the number of times the base is used as a factor	This is a DOK 1 item because students must determine the relationship between the base and exponent of a given exponential expression. This is an easy item

c. $3 \bullet 3 \bullet 3 \bullet 3 \bullet 3 \bullet 3 \bullet 3$ because the base tells you the number of times the exponent is used as a factor d. $3 \bullet 3 \bullet 3 \bullet 3 \bullet 3 \bullet 3 \bullet 3$ because the base tells you the number of times the base is used as a factor **Answer:** b	because the base is a whole number and no computation is required.
Approaching Proficiency: Identify or write an equivalent expression to a given exponential expression with a rational base and a whole number exponent.	
Select an expression that is equivalent to 2.3^6. a. $6 \bullet 6$ b. $2.3 \bullet 6$ **c.** $2.3 \bullet 2.3 \bullet 2.3 \bullet 2.3 \bullet 2.3 \bullet 2.3$ d. $6 \bullet 2.3$ **Answer:** c	This is a DOK 1 item because students must identify an expression equivalent to a given exponential expression. This is a difficult item because the base is a decimal.
At Proficiency: Evaluate an exponential expression with a rational base and a whole number exponent.	
Enter the value of the expression $\left(\frac{2}{3}\right)^3$. **Answer:** 8/27 or any equivalent answer	This is a DOK 1 item because students must evaluate an exponential expression. This is a medium-difficulty item because the base is a fraction.
Enter the value of the expression 8^5. **Answer:** 32,768 or any equivalent expression	This is a DOK 1 item because students must evaluate an exponential expression. This is an easy item because the base is a whole number and no computation is required.
Above Proficiency: Analyze an error made when evaluating an exponential expression with a positive rational number base.	
A student calculated the value of $\left(\frac{3}{8}\right)^3$ to equal $\frac{9}{8}$.	This is a DOK 2 item

Did this student calculate the value of the expression correctly or incorrectly? Enter your answer in the box and explain your reasoning. **Answer:** Students' answers may vary. Students should cite that the student solved the expression incorrectly. They may include that the student multiplied the base times the exponent when they should have multiplied the base by itself three times. Students may also include the correct answer of $\frac{27}{512}$ or any equivalent answer.	because students must analyze a solution to a given exponential expression to determine accuracy and provide reasoning for the determination. This is a medium-difficulty item because the base is a fraction. *Note: This item is built off the misconception the students may struggle to understand why raising a fraction to a whole number power results in a smaller value.*