

MeTEOR Performance Task

Eighth Grade

Mathematics
Scientific Notation



800-699-7516 | meteoreducation.com

MeTEOR[™]
CONNECTING THE DOTS

Complete Performance Task Scoring Rubric *Scientific Notation*

65-106 Proficient 50-64 Good 30-49 Satisfactory 10-29 Poor 0-9 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
<p>Task 1:</p> <p>A. To make very large and very small numbers easier to read and write.</p> <p>B. Answers will vary. Possible Explanations: Scientific to Standard: Write the coefficient-Add the number of zeros equal to the exponent-Move the decimal the number of places indicated by the exponent.</p> <p>Standard to Scientific: Write the number without the decimal point-Place the decimal so that the first number is greater than one but less than 10-Count how many places you moved the decimal point; use this as the exponent.</p>	1	1 2	3	
<p>Task 2:</p> <p>A. 6.0×10^{-6}</p> <p>B. 5.4×10^7</p> <p>C. 6.0×10^2</p> <p>D. 9.0×10^3</p> <p>E. 0.09</p> <p>F. 0.2</p> <p>G. 200,000</p> <p>H. 80,400</p>	2	1 1 1 1 1 1 1	8	

Task 3:

A.

Country	Liters of Soda Consumed Yearly	Liters of Soda Consumed Yearly (Scientific Notation)
United States	54,087,370,000	5.41×10^{10}
Australia	1,998,698,500	2.00×10^9
Canada	3,569,841,162	3.57×10^9
China	12,283,560,000	1.23×10^{10}
India	3,734,940,000	3.73×10^9
Japan	4,067,200,000	4.07×10^9
Mexico	17,478,127,638	1.75×10^{10}
Norway	532,935,832	5.33×10^8
Russia	4,311,000,000	4.31×10^9
Sweden	686,987,835	6.87×10^8
United Kingdom	5,351,220,000	5.35×10^9

B. Mexico, largest value

C. Norway consumes the least soda. It has the smallest exponent and the smallest coefficient.

D. Answers will Vary. Students should be dividing numbers in scientific notation in the following form (this is a comparison between the United States and Norway): Approximately 100 times:
 $(5.41 \times 10^{10}) \div (5.33 \times 10^8) = (5.41 \div 5.33) \times (10^{10} \div 10^8) \approx 1 \times 10^2 = 100$

Country	Liters of Soda Consumed Yearly (Scientific Notation)	How many more times the consumption of the US
Australia	2.00×10^9	27.06
Canada	3.57×10^9	15.15
China	1.23×10^{10}	4.40
India	3.73×10^9	14.48
Japan	4.07×10^9	13.30
Mexico	1.75×10^{10}	3.09
Norway	5.33×10^8	101.49
Russia	4.31×10^9	12.55
Sweden	6.87×10^8	78.73
United Kingdom	5.35×10^9	10.11

2

10

15

1

1

3

Task 4:

A.

Country	Liters of Soda Consumed Yearly In Scientific Notation (From Page 1)	Population	Per Capita Consumption (Amount Per Person)
United States	5.41×10^{10}	318,161,000	170 liters
Australia	2.00×10^9	23,514,100	85.00 liters
Canada	3.57×10^9	35,344,962	101 liters
China	1.23×10^{10}	1,364,840,000	9.00 liters
India	3.73×10^9	1,244,980,000	3.00 liters
Japan	4.07×10^9	127,100,000	3 liters
Mexico	1.75×10^{10}	119,713,203	146.00 liters
Norway	5.33×10^8	5,124,383	104.00 liters
Russia	4.31×10^9	143,700,000	30 liters
Sweden	6.87×10^8	9,675,885	71.00 liters
United Kingdom	5.35×10^9	63,705,000	84 liters

B. Mexico consumes the most soda. 146.00 liters is the largest amount.

C. India consumes the least soda. 3.00 liters is the smallest amount.

D. Answers will vary- students could make additive or multiplicative comparisons.

E. Answers will vary - students could consider a country with low consumption one that has room for growth or argue there is a reason it is low; a country with high consumption could be saturated, or could want more.

3
20
24
1
1
1
1

<p>Task 5:</p> <p>A.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Country</th> <th>Daily Consumption (liters)</th> <th>Daily Consumption per capita</th> </tr> </thead> <tbody> <tr> <td>United States</td> <td>1.48x10⁸</td> <td>0.46575 liters</td> </tr> <tr> <td>Australia</td> <td>5.48x10⁶</td> <td>0.23288 liters</td> </tr> <tr> <td>Canada</td> <td>9.78x10⁶</td> <td>0.27671 liters</td> </tr> <tr> <td>China</td> <td>3.37x10⁷</td> <td>0.02466 liters</td> </tr> <tr> <td>India</td> <td>1.02x10⁷</td> <td>0.00822 liters</td> </tr> <tr> <td>Japan</td> <td>1.11x10⁷</td> <td>0.08767 liters</td> </tr> <tr> <td>Mexico</td> <td>4.79x10⁷</td> <td>0.40000 liters</td> </tr> <tr> <td>Norway</td> <td>1.46x10⁶</td> <td>0.28493 liters</td> </tr> <tr> <td>Russia</td> <td>1.18x10⁷</td> <td>0.08219 liters</td> </tr> <tr> <td>Sweden</td> <td>1.88x10⁶</td> <td>0.19452 liters</td> </tr> <tr> <td>United Kingdom</td> <td>1.47x10⁷</td> <td>0.23014 liters</td> </tr> </tbody> </table> <p>B. Answers will vary. Countries with least consumption will barely cover the bottom of a container. The advantage is it makes the numbers much more tangible and meaningful.</p> <p>C. Answers will vary. Students should be thinking about what average means. A lot of the data (50% or so) will be close to the average so about half of the population probably consumes close to the average amount. However, there will be a percentage of people who consume way below the average, or not at all, and those who consume way above the average to balance each other to the average.</p>	Country	Daily Consumption (liters)	Daily Consumption per capita	United States	1.48x10 ⁸	0.46575 liters	Australia	5.48x10 ⁶	0.23288 liters	Canada	9.78x10 ⁶	0.27671 liters	China	3.37x10 ⁷	0.02466 liters	India	1.02x10 ⁷	0.00822 liters	Japan	1.11x10 ⁷	0.08767 liters	Mexico	4.79x10 ⁷	0.40000 liters	Norway	1.46x10 ⁶	0.28493 liters	Russia	1.18x10 ⁷	0.08219 liters	Sweden	1.88x10 ⁶	0.19452 liters	United Kingdom	1.47x10 ⁷	0.23014 liters	3	22	26	
Country	Daily Consumption (liters)	Daily Consumption per capita																																						
United States	1.48x10 ⁸	0.46575 liters																																						
Australia	5.48x10 ⁶	0.23288 liters																																						
Canada	9.78x10 ⁶	0.27671 liters																																						
China	3.37x10 ⁷	0.02466 liters																																						
India	1.02x10 ⁷	0.00822 liters																																						
Japan	1.11x10 ⁷	0.08767 liters																																						
Mexico	4.79x10 ⁷	0.40000 liters																																						
Norway	1.46x10 ⁶	0.28493 liters																																						
Russia	1.18x10 ⁷	0.08219 liters																																						
Sweden	1.88x10 ⁶	0.19452 liters																																						
United Kingdom	1.47x10 ⁷	0.23014 liters																																						
<p>Task 6:</p> <p>A. Answers will vary. (10 points for completion)</p> <p>B. Answers will vary. (10 points for completion)</p> <p>C. Answers will vary. (10 points for completion)</p>	4	10	30																																					
TOTAL POINTS:																																								



meteoreducation.com . 800.699.7516

MeTEOR CONNECT, MeTEOR Education and MeTEOR Design are trademarks or registered trademarks of MeTEOR Education, LLC © 2019.

All rights reserved. PTMATH8.3