**Gas Law CER**

**The Question:** Paintball is a popular recreational activity that uses a metal tank of compressed carbon dioxide or nitrogen to launch small capsules of paint. A typical tank has a volume of 508 cubic centimeters. A 340.-gram sample of carbon dioxide is added to the tank before it is used for paintball. At 20 °C, this tank contains both CO2*(g)* and CO2*(l).* After a paintball game, the tank contains only CO2*(g).*

After the paintball game, the tank has a pressure of 6.1 atmosphere and is at 293K. If the tank is heated to 313K, the pressure in the tank will change. Show a numerical set-up and calculation for determining the new pressure of the gas in the tank.

**Predict:** What do you think will happen to the pressure inside the gas tank as the temperature increases? Explain briefly.

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**Evidence:**

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| **Textual Evidence** | **Equations** | **Calculations** |
|  | * Combined Gas Law * Manipulated Equation |  |

**Reasoning:**

* Describe the *law* that predicts the relationship between pressure and temperature
* Describe the *type* of relationship between pressure and temperature (indirect or direct)
* Explain what is going on, on a molecular level, inside the tank as the temperature changes *in terms of* average kinetic energy, temperature, number of collisions, and pressure.
* Describe whether or not your evidence supports your prediction.

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**Claim:** What is the new pressure inside the gas tank? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gas Law CER Self-Assessment & Rubric**

**Self-Assess**

**Directions:** Look at the rubric below and grade yourself. Explain why you rated yourself the way you did and how you can improve your final product. This part is part of your grade and must be completed.

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**Rubric**

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| --- | --- | --- | --- |
| **Criteria** | **Needs Work (1)** | **Proficient (2)** | **Exemplary (3)** |
| **Claim** | Claim is not clear, or stated in paragraph | Claim is somewhat clear, but isn’t sound scientifically | Claim is clear and sound scientifically |
| **Prediction** | No prediction present | Prediction but no explanation | Prediction and explanation present |
| **Textual Evidence** | NO evidence is used from the text to help support the claim. | Some evidence is used from the text to support claim. All evidence may not be accurate in supporting claim | Evidence is used from the text to help support the claim. Evidence is accurate and supports claim. |
| **Calculations** | Incorrect Calculations | Correct calculations, no units | Correct calculations and appropriate units. |
| **Reasoning** | No reasoning is given for the claim. No vocabulary is used to support evidence/claim. | Reasoning is given using some scientific concepts. Vocabulary is used, but not 100% accurate in supporting the claim | Reasoning is given using correct scientific concepts. Vocabulary is used to support the claim/evidence. All vocabulary is used correctly. |
| **Grammar/**  **Writing** | Full sentences are not used throughout the paragraph answer. There are more than 5 spelling or punctuation errors. Paragraph isn’t long enough to support claim. | Full sentences are used in the answer. There are some small spelling and punctuation errors throughout the paragraph (3 or less) Paragraph is long enough to properly support the claim. | Full sentences are used throughout the answer. No spelling or punctuation errors are found in the paragraph. Paragraph is long enough to properly support the claim. |
| **Self-Assessment** | No self-assessment present | Little to no explanation of self-assessed grade | Strong explanation of self-assessed grade |

**Total Points: \_\_\_\_\_\_\_\_\_\_\_\_\_/21**

**x 2 = \_\_\_\_\_\_\_\_/42**