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| **ACTIVITY ANSWER GUIDE** |
| 1. Depends of substances to be selected  2. Depends of substances (S) to be selected. Average of melting points =  3. Melting point units are either degrees Centigrade (metric) or Fahrenheit (English).  4. The chocolate that has the lowest melting temperature will melt the fastest; in our case is the white chocolate.  5. If we want to prevent chocolate to melt (at room temperature), the melting point of the chocolate needs to be increased and this can be done by creating an emulsion. An emulsion, a homogeneous mixture of many substances, will have a higher melting point than the pure substances that are part of the mix.  6.   |  |  |  | | --- | --- | --- | | 1. Solid | 2. Add heat  4. Remove heat | 3. Liquid |   7. A substance before melting is a solid; a solid’s molecules vibrate in place and are at lower temperature than a liquid. After adding energy (heat) the solid melts and molecules have higher energy. A liquid’s molecules are able to slip and move between each other and, therefore, liquids can be poured.  8. A pure substance will have a shorter range of melting temperature, between 2 or 3 degrees. For example two given samples, sample S1 melts between 40oC to 43oC and sample S2 melts between 42oC to 62oC. From this information, it can be inferred that Sample S1 most probably is a pure and sample S2 is a mixture.  **Part B – Chocolate Bar Experiment Research**  Observe the melting process of the three types of chocolate and notice which one starts to melt first, which one melts the fastest, and which one takes the longest time to melt. Record temperatures, start melting time and finish time required to complete melt.  **Part C - Engineers’ Report:**  1 & 2. Chocolates will melt depending on the brand and composition of chocolate. Chocolates most probably will start to melt in the following order: white, milk and then dark. The following are approximately starting melting points: White chocolate 80oC, milk chocolate 85oC, dark chocolate 88oC. The range of melting point from start to finish is large and may vary (±10oC), meaning it may take a while for the chocolate pieces to melt completely. Remember that the range of melting is large since chocolate is a mixture of ingredients  3. The chocolate that should be placed in the refrigerator is the one with the lowest melting temperature; in our case is the white chocolate.  4. The chocolate with the highest melting temperature (dark) can be left at room temperature.  5. Plot Chocolate type vs. Temperature (melting temperature values may range around these values). |