Name:

Period:

Salting Roads & Corrosion

1. Salt water freezes at a temperature lower/higher/the same compared to pure water.
2. Describe “vibrational motion.”
3. Freezing point depression is the difference between what two values?
4. The more concentrated the solution, the \_\_\_\_\_\_\_\_\_\_\_\_\_ freezing point.
5. Highway workers use salt in two ways:



1. What is it about some locations in Canada and Alaska (and Rexburg, Idaho) that causes salting roads to be ineffective there?
2. Water molecules at the surface of an ice crystal are more \_\_\_\_\_\_\_\_\_\_ and more \_\_\_\_\_\_\_\_\_\_\_.
3. Define “eutectic temperature.”
4. What is the eutectic temperature for a NaCl and H2O mixture (in Celcius)?
5. What is the practical limit for salting road ice?
6. What is the practical relationship between questions #6 and #10?
7. In what **two** ways does vehicle traffic help decrease road ice?
8. What **two** advantages are given for using magnesium chloride or calcium chloride instead of NaCl?

1. What is the number of dissolved particles provided by NaCl?
2. What is the number of dissolved particles provided by CaCl2 and MgCl2?
3. Canada is geographically the same approximate size as the U.S. (9 million km2). What is the likeliest reason Canada’s road-salt usage is approximately 1/3 that of the U.S.?
4. What is the main reason that bridges freeze before roads?
5. What is the main purpose of the molasses used in some deicing substances?
6. Steel is mostly a mixture of what two elements?
7. What other elements are mentioned as ingredients in steel?
8. What part of steel corrodes?
9. Is iron oxidized or reduced when it rusts?
10. Without a \_\_\_\_\_\_\_\_\_ to connect potential anodes and cathodes, cars would virtually last forever.
11. What is the chemical name for rust?
12. What is the chemical formula for rust?
13. What is the source of the salt in coastal areas?
14. What is the source of the salt in northern states (and Utah)?
15. How does the presence of salt make corrosion faster?
16. What two metals are suggested that do not corrode easily?
17. What car variety, made of stainless steel, is given as an example of a way to avoid corrosion?
18. What is considered the best way to prevent corrosion in cars?
19. What organization is mentioned as one of the largest investors in antirust research?
20. What is used as a final example of a military asset that may malfunction due to rust—with tragic results?