Name _____ Date _____ Period _____

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Bond Properties

Chemistry

Draw Lewis structures when you need to find bond rank. Higher bond rank gives a shorter, stronger bond. Bigger atoms give a longer, weaker bond.

1. Give the bond rank of the carbon-carbon bond in ethane (C_2H_6), ethene (C_2H_4), and ethyne (C_2H_2). Then rank the three bonds from shortest to longest.

2. Which bond is stronger, H–Cl or H–Br? Explain without using data.

3. Put these bonds in order of increasing bond length: H–S, H–O, H–Se.

4. Use the data to answer. (a) Which bond has the highest bond energy? (b) Which has the lowest?

Bond	**C–N**	**C=N**	**C≡N**
Length (pm)	147	129	116

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5. Which has the longer carbon-oxygen bond, CO or CO_2? In CO, the carbon and oxygen atoms share three pairs of electrons. Explain.

6. Which oxygen-oxygen bond is stronger: the bond in O_2, or the bond in hydrogen peroxide, H_2O_2 (atoms connected H–O–O–H)? Explain.

7. An O–H bond in water takes about 463 kJ/mol to break. A hydrogen bond between water molecules takes about 20 kJ/mol. When water boils, which one is overcome? Explain using these numbers.

8. A student says the longest bond is the strongest because the atoms have more room. Correct the student.

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