HOW MANY DIFFERENT "ISOMERS" CAN YOU BUILD?

**Purpose:** To solve the puzzle of isomers.

**Background:** ISOMERS are different molecules that have the same formula. They have the same number of hydrogen and carbon atoms, but are geometrically and/or structurally different. Isomers are chemically similar, but yet they react slightly differently. Melting point and boiling point vary slightly for isomers with the same formula. Some isomers are naturally occurring while others can only be made in the laboratory.

**Instructions:**

1. *BE GENTLE WITH THE KITS AND PUT IT ALL BACK IN THE BOX!*
2. For each molecular formula build as many ISOMERS as possible (see definition above). *DO AS MANY AS YOU CAN.* Don't go on until all isomers are built.
3. Draw a sketch on the back or scratch paper of the structure of each UNIQUE isomer.
4. COUNT the number of isomers you find for each and write that number next to the formula below. Don’t count 2 isomers that are really the same.

   ___ CH₄
   ___ C₂H₆
   ___ C₃H₈
   ___ C₄H₁₀
   ___ C₅H₁₂
   ___ C₆H₁₄
   ___ C₇H₁₆
   ___ C₈H₁₈
   ___ C₉H₂₀
   ___ C₁₀H₂₂
   ___ C₁₁H₂₄

Genius question #1: How many hydrogens on a molecule with “n” carbon atoms AND only single bonds? *(make an algebra formula such as “4n – 3”)*

Genius question #2: How many unique isomers for a molecule with “n” carbon atoms?