Name: _____ **Date:** _____

Answer Key: The Secret Lego Bricks of Life: Organic Chemistry for Kindergartners

How do tiny invisible hands hold everything together? Kids will design and predict how carbon 'hooks' create the world around them.

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1. Imagine Carbon is a friendly octopus. How many 'tentacles' or hands does he have to hold onto his friends?

Answer: C) 4 hands

Carbon atoms have four valence electrons, meaning they like to make four bonds, or 'hands,' to connect with other atoms.

2. True or False: Carbon atoms can hold hands with other Carbon atoms to make a very long parade line.

Answer: A) True

This is called catenation! Carbon is special because it can form long, stable chains to build complex things like your toys or your skin.

3. If we want to build a 'ring' of Carbon atoms to make a shape like a crown, what is the smallest number of friends we need to close the circle?

Answer: C) 3 friends

Just like a triangle is the simplest closed shape, organic molecules need at least three carbons to form a ring structure.

4. If Carbon and Hydrogen joined together to make a 'necklace' that smells like a lemon, what are they building?

Answer: B) A molecule

A molecule is a group of atoms bonded together. When carbon forms specific patterns, it creates the scents we find in nature.

5. True or False: Every single thing that is alive, like a puppy or a tree, is made using Carbon building blocks.

Answer: A) True

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Organic chemistry is the study of life! Carbon is the foundational element for all living organisms on Earth.

6. Carbon is very strong. If we squeeze Carbon atoms together very, very hard for a long time, they can turn into a shiny ___.

Answer: C) Diamond

Diamonds are made entirely of carbon atoms arranged in a very strong, repeating crystal pattern.

7. Sometimes Carbon atoms use TWO hands to hold onto ONE friend. What do scientists call this 'double' grip?

Answer: A) A double bond

In chemistry, when two atoms share four electrons (two pairs), it is called a double bond, which makes the connection stronger and changes the shape.

8. True or False: You can turn a piece of soft plastic into a different shape because the Carbon chains are sliding past each other like cooked spaghetti.

Answer: A) True

Polymers (like plastics) are long carbon chains. Their flexibility often comes from how these long chains interact and move.

9. We breathe out a gas that has one Carbon and two Oxygens. It is what plants 'eat' to grow. What is it?

Answer: B) Carbon Dioxide

Carbon dioxide (CO_2) is a simple organic-related molecule where carbon connects with oxygen, showing how carbon moves through the air and living things.

10. If you were a chemist and you wanted to build a molecule that was very STIFF and didn't move, which shape would you use?

Answer: C) A criss-cross cage

Cross-linking or 'cage' structures (like in graphene or diamond) create rigid materials, while straight lines are often more flexible.