

Normal Ocean Chemistry Mat

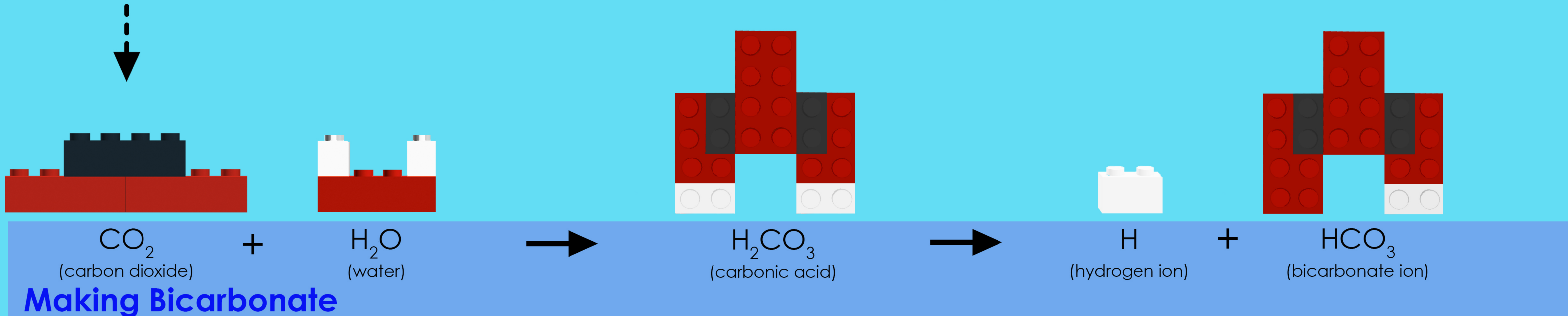
Follow the numbers for the two different chemical reactions.
*EXTRA BUILDING INSTRUCTIONS are in the box on the bottom left.

1 A small amount of carbon dioxide (CO₂) is normally present in the air. **Build 1 CO₂ molecule and place it on its picture in the air.**

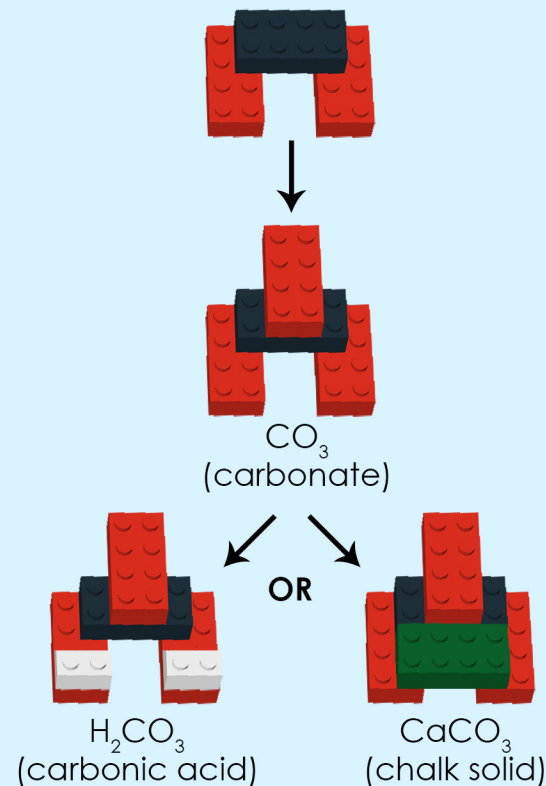
2 The oceans absorb CO₂ from the air. **Move the CO₂ molecule into the ocean as shown with the dotted line. Build 1 H₂O molecule and place it on its picture.**

3 Carbon dioxide (CO₂) and water (H₂O) react to produce carbonic acid. **Take apart the CO₂ and H₂O molecules. Use the molecules to build a molecule of carbonic acid (H₂CO₃) as shown*. Place it on its picture.**

4 The hydrogens in carbonic acid (H₂CO₃) are not tightly attached. One hydrogen can easily fall off. **Take off 1 hydrogen from the carbonic acid molecule. Place the hydrogen and bicarbonate (HCO₃) on their pictures and leave them there. Start the next reaction with new bricks.**

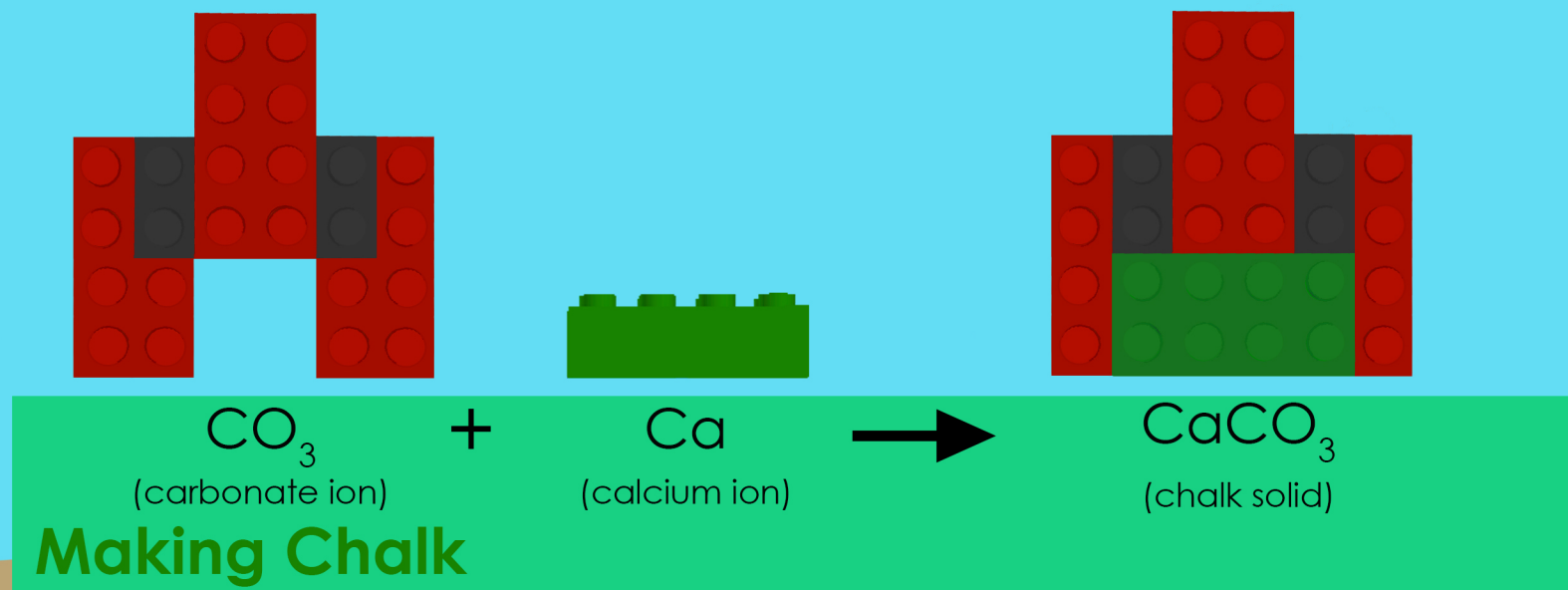


*EXTRA BUILDING INSTRUCTIONS:



1 Calcium (Ca) and carbonate (CO₃) are molecules that are dissolved in ocean water. **Build the models of Ca and CO₃ as shown* and place them on their pictures.**

2 Creatures in the ocean take calcium (Ca) and carbonate (CO₃) from the water and build chalk (CaCO₃). **Add Ca to CO₃ as shown*. Place the model of chalk on its picture. Read the conclusion.**



Conclusion

Making chalk (biomineralization) is a very important process in the ocean. Sea shells and coral reefs are made from chalk.

Normal ocean water has the correct balance of free hydrogen and carbonate molecules for living creatures to make chalk.

This is my home! Living creatures create shells and coral structures with chalk.