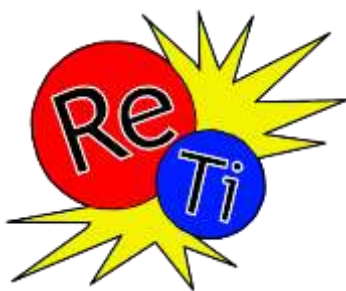


# Reaction Time

*React in time, or get blown away!*



## Introduction

I wanted to find a way to get more children and young adults more interested in academic pursuits. I understand how difficult subjects like math, chemistry, economics, and calculation-based subjects can be. I know many people struggle with understanding chemistry concepts and I wanted to create a game that got players involved enough to keep their interest, and teach them chemistry basics in a fun and exciting way. Reaction Time is a blend of card game mechanics with a chemistry theme to help reinforce fundamental chemistry information.

## Components and Requirements

2 decks (one white, one black) of 64 cards (128 cards total)

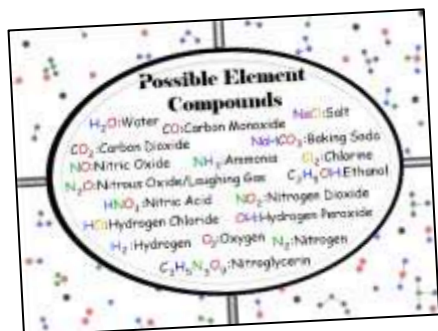
For 2 Players, ages 12 and up

30-60 minutes



## Overview

The main function of this game is the construction and deconstruction of Chemical Compounds (CCs) with Chemical Elements (CEs). There are six different CEs in each deck—enough of each to create plenty of CCs, but only six of the fundamental elements found in most chemical reactions (Carbon, Oxygen, Nitrogen, Hydrogen, Sodium, and Chlorine). Catalyst cards are used to give a player bonuses, and Inhibitors are used to give the Opposing Player (OP) a hard time. In each deck is a reference card that lists possible CCs—this is not the limit to your ability to create; if you can think of other CCs, go right ahead and construct them!

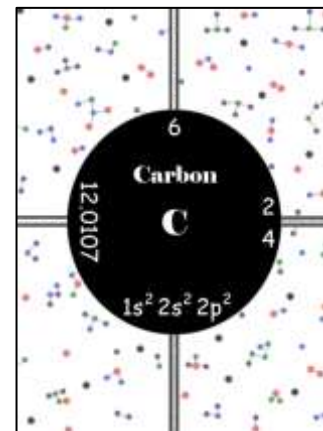


## Setup

Each player is to use one (1) deck for the game. Remove the “Possible Element Compounds” card from your deck and place that card face-up beside you on the table. This is a quick reference for you to use during the game. Find two (2) Hydrogen, two (2) Oxygen, two (2) Carbon, and two (2) CEs of your choice. Play these eight (8) cards (in honor of the Octet Rule) face-up in a horizontal line in front of you to make up the Environment cards (elements already present in the atmosphere). You will build on these to create your CCs. After your eight (8) Environment cards are set, shuffle your deck, place it face-down beside your Environment cards, and then draw five (5) cards for your hand. You will have a discard pile next to the draw pile. Each player will also need a way to keep score. Before you play, it is important to understand your cards.

## Card Layout

*Chemical Element cards:* The Chemical Element cards hold a lot of important information. In the center of the colored element (colors are just used to distinguish elements) is a letter or a few letters and the name of the element. The CE information is presented as you would find it on the Periodic Table of Elements. Above the Element Name and Abbreviation is the Atomic Number. To the right is the number of electrons in each electron shell (see Bohr's Model and modifications). On the bottom of the element is the Electron Configuration of that element. Finally, the numbers to the left are the Atomic Mass numbers. Only the Name/Abbreviation and Atomic Number affect gameplay. The other information on the card is just for educational reference.



*Catalysts and Inhibitors:* Below the card type identifier (Catalyst/Inhibitor) is the title of a theory, model, or fact that is important to understanding major chemistry principles. Below this name is a description of this theory's, model's, or fact's application and/or history. On the bottom of these cards are descriptions of what each card will do for the game (and who it affects). That's it! Pretty simple so far, right?

Well, you are ready to play!



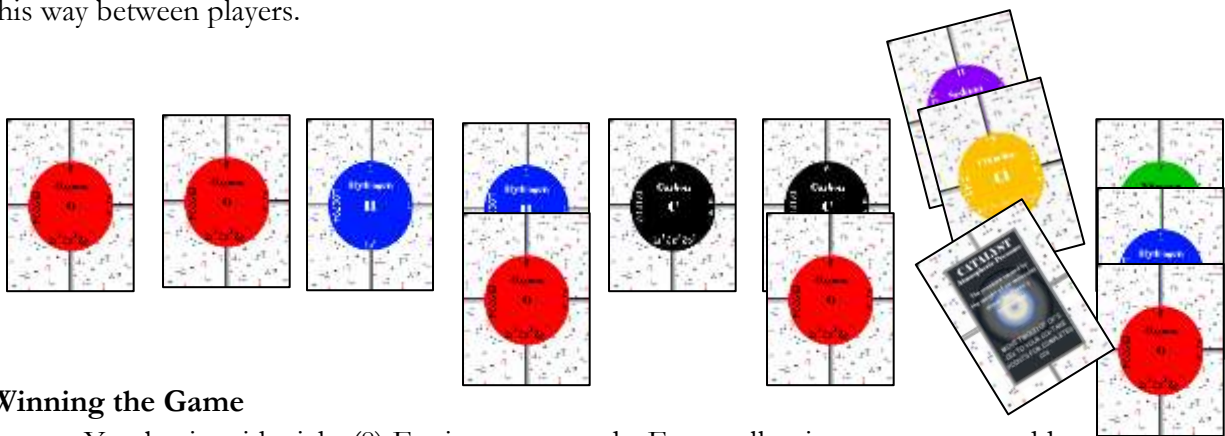
## Game Play

Players decide, using whatever technique they prefer, which player will go first. There are only three phases of play in this game: The Draw Phase, the Play Phase, and the Collect Phase.

**DRAW:** To start your turn, draw one (1) card—there is no minimum or maximum for the number of cards in your hand, but it is good to keep a balance for play.

**PLAY:** You may play only one (1) CE and/or one (1) Catalyst/Inhibitor from your hand per turn (unless a card instructs otherwise). You play your CEs vertically in a chain as you build the CC. The CC can start with any CE. For example, H<sub>2</sub>O can be built on an Oxygen Environment CE (O+H+H). You can play Catalysts/Inhibitors wherever you want in the playing area to reveal it, unless the card instructs you to play it in a specific area (discard when used). You will have to develop solid strategies to get ahead of your opponent using the cards in your hand (even if your current hand is weak, you still stand a chance to win in this game). Think carefully about when you should use your Inhibitors and Catalysts (some counter each other) and be careful when and how you play CEs (some can be altered). When playing on any CC, you may not play a CE that is incompatible with what is being constructed; if it will completely block the CC from becoming a real CC, it's an illegal play. This reflects real life where only feasible chemical reactions take place. Consider playing a card that will make the player take more turns to complete the CC than, for example, H<sub>2</sub>O. You don't have to play any cards on your turn, if that's your preference; you may want to save a card for another turn. In this case, just skip this phase.

**COLLECT:** If you are content with a CC (remember that it must be built to represent a real chemical compound), you may claim points from that CC. To do this, you declare the compound, state that you are claiming points, then remove that CC from play (discard after you add the points). Add up all of the Atomic Numbers of the cards in the CC. This score is added to your total (e.g. H<sub>2</sub>O = 1 + 1 + 8 = +10 to score). **You may only collect one (1) CC per turn.** Whenever you collect a CC (or run out of draw pile cards), shuffle your discard pile back into the draw pile (in honor of the Law of Conservation of Mass) and then your turn is over and play goes back and forth this way between players.



### Winning the Game

You begin with eight (8) Environment cards. Eventually, since you cannot add new elements into the Environment (we are but mortals, after all), one of the players will run out of Environment cards. When this happens, the game is over (Note: the person who collects the last CC is not necessarily the winner). The player that still has CCs on the table must add up all the leftover scores (the total from the Atomic Numbers of all the CEs still on the table) and subtract this number from their collected score. The player with the highest final score is the winner of this round. Play as many rounds as you'd like (2 or 3 is typically good for time), then the player with the most points after all of the rounds is the winner of the game.

### Optional Rules

- You can play with three or more people if each person has a separate deck of a different color. Rules for two player games all apply the same way, but turns are passed around to the left and you may target anybody as your OP for that action.
- You can play this game like 'Bridge', 'Hearts', 'Spades', and other similar games. You will need four players, and players who sit across from each other are partners. For this game, you do not play on your own cards, only—you and your partner work together and build off each other's CCs with your CEs and you may pick either OP as the target OP for one action. The round is over when one team collects their last CC. Partners share a total score and the "best team" wins.