

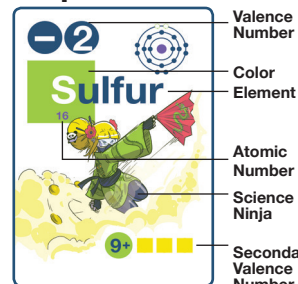
SCIENCE NINJA Valence PLUS

2-4 players, Ages 10+

Game Components

Element Cards

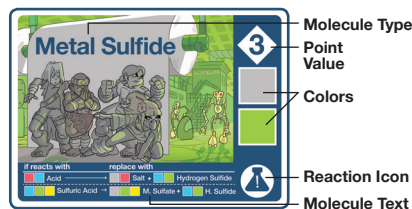
12 Oxygen
10 Hydrogen
8 Sulfur
8 Sodium
6 Fluorine
6 Chlorine
4 Carbon
4 Potassium
2 Copper
2 Zinc
1 Calcium
1 Helium*
1 Oganesson*



Game Board

Molecule Cards

8 Salt
8 Water
8 Acid
6 Hydrogen Sulfide
6 Carbon Dioxide
6 Carbon Disulfide
5 Carbonyl Sulfide
7 Metal Oxide
7 Base
7 Metal Sulfide
7 Metal Hydrosulfide
4 Deadly Carbonyls
4 Thiophosgene
4 Sulfur Trioxide
4 Sulfuric Acid
3 Halocarbon
2 Metal Sulfate
2 Bisulfate
3 Transition Metal Compound



*Optional. Shogun recommends playing the game without these cards the first time you play!

Getting Started

- Arrange the Molecule Cards on the board to form the **Molecule Bank**. Add the **Element Deck** and remove the first card and place it face up next to the Element Deck to form the **Discard Pile**.
- Shuffle the Element Deck and deal each player **6 Element Cards**.
- The player with the Element Card with the **highest atomic number** (that's the purple number in the bottom of the color box) **goes first** and the player to their left goes second (clockwise). Zinc is the highest card - whoever has it usually goes first! If there's a tie, use the next highest atomic number to determine who goes first.

Your Turn

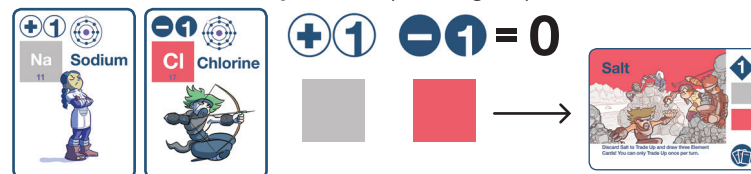
Phase I: Collecting Cards

A player's turn begins with choosing one of the four following ways to collect Element cards:

- Draw** - Draw one card from the Element Deck. If you have only one card, draw two. If you have no cards, draw three. If only drawing one card, you may draw the top card from the Discard Pile.
 - Exchange** - Discard your Element cards and draw three new ones.
 - Trade Up** - Discard (return to the Molecule Bank) a Salt or Hydrogen Sulfide card to draw three Element Cards. You can only Trade Up once per turn.
 - React** - React a Molecule from your Stash with another - yours or an opponent's - and draw three Element Cards from the Element Deck! You can only React once per turn (see section on Reacting).
- If the Element Deck runs out of cards, shuffle and reuse the Discard Pile.
 - Players **can** hold more than six Element Cards at the end of Phase I.

Phase II: Building Molecules

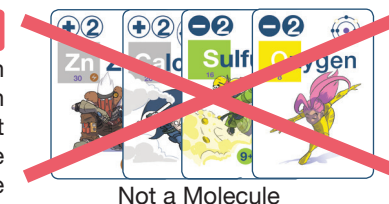
- Build Molecules by finding combinations of your Element Cards whose **Valence numbers add up to zero** (see diagram).



- Take the Molecule from the Molecule Bank that matches the colors of the Element Cards (see diagram). You can check that you made the correct Molecule by looking at the back of the Molecule card.
- Place the Molecule face up in front of you so all opponents can see - it is now in your **Molecule Stash**.
- Place the Element Cards that built the Molecule in the Discard Pile.
- Repeat steps 1-4. Your turn ends when you are finished making Molecules. If you have more than six Element Cards, discard to six.

Science Ninja Alert!

Players make a common error when combining too many Element cards with Valence numbers that add up to zero. But if you can make a smaller subset of those elements that add up to zero, you make those molecules instead!



Building Molecules with Secondary Valence Numbers

Sulfur, Zinc, and Copper have secondary Valence numbers in their lower right corners. Flip them upside down to see how they combine with other Elements.

Sulfur



Three yellow squares next to Sulfur's secondary Valence number of +6 means you can flip it upside down to combine with three Oxygens to form Sulfur Trioxide.




Copper and Zinc



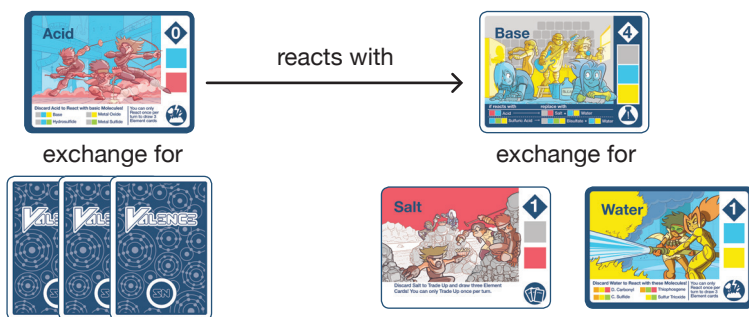
The adjacent brown circles with zeroes mean you can flip Zinc or Copper upside down to combine with another Zinc or Copper to form Transition Metal Compound.



Reacting

If you have a navy-bordered Molecule with the  symbol in your Molecule Stash, it is a **Reactor** and can react with other white bordered Molecules.*

1. **Find a Molecule and React.** The bottom of your Reactor tells you what Molecules you can react with. React with an opponent's Molecule or your own!
2. **Discard Reactor and Draw Element Cards.** Return the Reactor to the Molecule Bank. Draw three Element Cards.
3. **Collect Products.** Whoever owns the white-bordered Molecule replaces it with the products of the reaction. Find the products of the reaction on the bottom of the white bordered Molecule.



You can only react once per turn.


Blocking Reactions

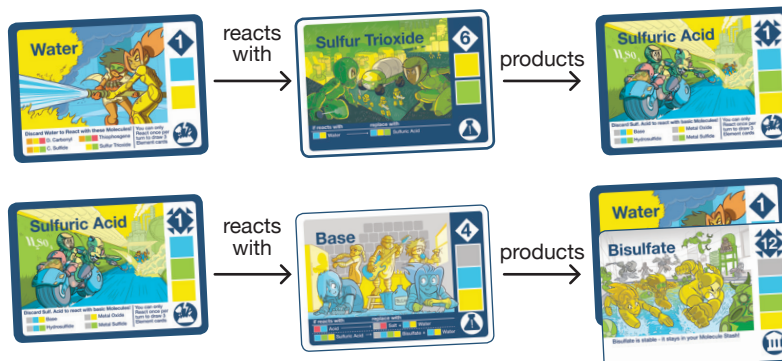
If you have a Transition Metal Compound in your Stash, you can block any reaction with your Molecules. But if an opponent reacts two acids on the same turn (either Acid or Sulfuric Acid) with your Transition Metal Compound, your opponent draws three Element Cards and you exchange your Transition Metal Compound for a Salt.



*Scientifically speaking, either molecule can react with the other but for the purposes of our game only one class of molecules (acids, water) can react with the others.

Complex Molecules














Sulfuric Acid, Metal Sulfate, and Bisulfate have the  symbol in their upper right hand corner. These **Complex Molecules** cannot be made by combining Element Cards - they can **only** be made as products of Reactions.



Winning the Game

Each Molecule is worth a different **point value**, noted in the diamond in the corner. The first player to **16 points wins the game!**

Symbol Guide

	Stable Molecule		Hydrogen
	Reactor		Alkali / Alkaline Earth Metal
	Vulnerable to Reaction		Transition Metal
	Blocks Reactions		Carbon
	Complex Molecule		Oxygen
	Trade Up		Sulfur
			Halogen



Strategies

- Try to **use all of your Element Cards** - then **draw 3** on your next turn without discarding a Reactor or a Salt! More cards = more molecules!
- You can put Element Cards in the **Discard Pile** in **any order you choose**. If you have **Bases**, don't put anything that could make **Acids** on top!
- If an opponent has Sulfur Trioxide, you may want to use Water to react and reduce their points. Just make sure they don't have a basic Molecule to react with on their turn or they'll make Metal Sulfate or Bisulfate!
- You can quickly build high-value but vulnerable Molecules, steadily add stable Molecules, or take the long path to constructing the game-clinching Complex Molecules. There's more than one way to win! Adjust your strategy to the cards you collect!
- If a player has at least **10 points**, watch out - they **might win on their next turn!** Attack them with everything you've got!

Alternative Rules

- If playing with **younger players**, disregard the reactions and the text on the bottom of the Molecule cards to just focus on building Molecules.
- For a science challenge, require players name the specific Molecule they're building. For instance, if a player forms a Base from Sodium, Hydrogen and Oxygen, they must declare they've made Sodium Hydroxide. If they get it wrong, they can try again next turn. **Great for classrooms!**
- You can take out the Sulfur, Zinc, Copper, and two Sodium Element Cards and play a game to 10 points to play the **original Valence!**
- **Play cooperatively!** Players work together to build every type of Molecule on the board. But you only get one reshuffle of the discard pile - if you run out of cards everyone loses, so learn to work together!
- Shuffle in **Helium** and / or **Oganesson** to add some diversity. Be warned: these cards make the game longer, and sometimes, more frustrating!

Watch our how-to-play video and read science comics at www.scienceninjas.com

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