**General Instructions**

3-8 players

Ages 10+

Objective: Be the last player left on the board.

Set-up:

1. Place the reaction card pile and cornucopia card pile side by side in the center of the game board.
2. Deal each player 3 cornucopia cards (red).
3. Each player, place your pawn on one of the four white starting blocks on the circle.

How to play:

* Youngest player goes first, then play continues clockwise.
* Roll the die and move your pawn that many spaces clockwise.
* If you land on a red space, pick a cornucopia card and keep it for use on a later turn. If you land on a blue space, pick a reaction card and do what it says.

Cards:

* **Cornucopia** cards help you. Keep them until they can be of use.
* **Reaction** Cards have high risk and high reward. Follow the directions on the card. It may have an immediate outcome, or it may direct you to the Reaction Instructions.

**Reaction Instructions**

**Lemon LED:** light an LED through an oxidation-reduction reaction

Equations:

Zn → Zn2+ + 2e-

H2+ + 2e- → H2

Steps:

1. Align the four lemons parallel to one another.
2. Attach one of the alligator clips to the nail (negative terminal) on your first lemon.
3. Then, run the second jumper wire from the penny (positive terminal) of the first lemon to the nail (negative terminal) in the second lemon. Add the rest of the clips, alternating positive and negative, until all the lemons are attached.
4. Connect the first jumper wire from the nail to the negative connection on the LED. The negative connection on the LED is the shorter wire nearest the base.
5. Then, clip the jumper wire from the penny of the last lemon in your chain to the positive connection on the LED. When you complete your circuit, the LED will light up!

Results: If you successfully turn on the LED, your trap works, and you can set it on the player of your choice. They are out of the game unless they have a cornucopia card to counteract it. If the LED doesn’t turn on, the trap backfires and you are out of the game.

Safety Precautions: No safety equipment needed.

Zn2+ slightly hazardous (irritant); do not ingest or inhale.

H2 extremely flammable; may explode if heated.

**Double displacement:** Mix two chemical compounds to see if they react.

Info: In a double displacement reaction, two aqueous, ionic compounds exchange ions and form two new ionic compounds.

Equations:

2NaOH + Cu(NO3)2 → 2Na(NO3) + Cu(OH)2

2NaOH + K2CrO4 → Na2CrO4 + 2KOH

NaOH + AgNO3 → AgOH + NaNO3

NaOH + NaC2H3O2 → NaOH + NaC2H3O2

Cu(NO3)2+ K2CrO4 → 2K(NO3)+ CuCrO4

Cu(NO3)2+ AgNO3 → AgNO3+ Cu(NO3)2

Cu(NO3)2+ 2NaC2H3O2 → 2NaNO3+ Cu(C2H3O2)2

K2CrO4 + 2AgNO3 → Ag2CrO4 + 2KNO3

K2CrO4 + 2NaC2H3O2 → Na2CrO4 + 2KC2H3O2

AgNO3 + NaC2H3O2 → NaNO3 + AgC2H3O2

Steps: You have 5 chemicals to choose from: NaOH, Cu(NO3)2, K2CrO4, AgNO3, and NaC2H3O2. Pick two of the chemicals. Squeeze one or two drops of each chemical into the watch glass.

Results: If it turns a different color, it formed a precipitate; you picked a poisonous nightlock berry and are out of the game. If it is translucent, it’s a soluble solution and you are safe.

Safety Precautions: Wear gloves and do not touch your face until you have washed your hands.

NaOH corrosive, irritant, permeator; do not touch or ingest.

Cu(NO3)2 irritant; do not ingest or inhale.

K2CrO4 irritant, sensitizer, corrosive, permeator; do not touch or ingest.

AgNO3 very hazardous irritant, hazardous permeator, slightly hazardous corrosive; do not touch or ingest.

NaC2H3O2 slightly hazardous irritant; do not ingest or inhale

**Single Replacement:** produce hydrogen gas and zinc chloride.

Info: In a single replacement reaction, an element replaces its like element in an ionic compound or acid. It will only react if the element is more reactive than its like element in the compound.

Equation: Zn+ 2HCl → H2 + ZnCl2

Steps: Drop the pre-measured amount of zinc into the Erlenmeyer flask full of water. If you do it correctly, it should look like an eruption with fog and bubbles.

Results: If the reaction properly produces hydrogen gas, your knockout gas is contained and you can choose a player to knock out of the game. If the reaction fails, you are out of the game.

Safety Precautions: One of the reactants is a very strong acid, and the reaction produces heat. If you are under the age of 15, the game masters will do the reaction for you. REMEMBER- Wear gloves, an apron, and goggles during this reaction.

Zn highly flammable, gives off toxic fumes when burned; do not touch, inhale, or ingest.

HCl very hazardous corrosive and irritant; do not touch, inhale, or ingest.

H2 extremely flammable; may explode if heated.

ZnCl2 gives off irritating or toxic fumes if burned; do not touch, inhale, or ingest.

**Production of Gas:** produce CO2 gas to blow up a balloon.

Equation: NaHCO3 + HC2H3O2 → CO2 + H2O + NaC2H3O2

Steps:

1. Put between 1 and 6g of sodium bicarbonate (baking soda) into the balloon
2. Add 4 Tbsp of acetic acid (vinegar) into the Erlenmeyer flask.

Results: Choose your amount of baking soda wisely, as it will determine how much the balloon inflates. Measure its diameter. If it is more than 2 inches in diameter, you are safe. If not, you are out of the game.

Safety Precautions:

NaHCO3 slightly hazardous irritant, do not touch, ingest, or inhale.

HC2H3O2 corrosive, permeator, very hazardous irritant; do not touch, ingest, or inhale.

NaC2H3O2 slightly hazardous irritant; do not touch, ingest, or inhale.

CO2 may explode if heated; may displace O2 and cause suffocation; do not inhale.

H2O water; not dangerous.

**Combustion:**  Create a path of colored fires by lighting an ethanol string lined with different ionic salts.

Info: Combustion reactions always involve a hydrocarbon and oxygen as reactants and carbon dioxide and water as products.

Equation: C2H6O+ 3O2 → 2CO2+ 3H2O

SAFETY CAUTION: This reaction involves matches. If you are under 18, the game makers will set the reaction for you. Remember to have a hot mit ready in case the string falls off and onto the board.

Steps:

1. The game makers will soak the string in ethanol, add the salts, and put it in place
2. If you are over 18, you can light the match and hold it to the end of the string to initiate the reaction. If you are under 18, the game makers will initiate the reaction.

Results: For this reaction, you are out of the game whether it works properly or not.

Safety Precautions:

C2H6O hazardous irritant, slightly hazardous permeator.

O2 accelerates combustion.

CO2 may explode if heated; may displace O2 and cause suffocation; do not inhale.

H2O water; not dangerous.