

Large Hadron Collider

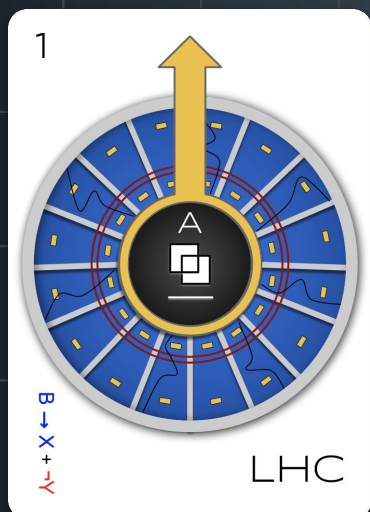
2 Players
20 Minutes
12+ Age

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Components

- ⊕ 4 Particle A cards
- ⊕ 4 Particle B cards
- ⊕ 4 Particle X cards
- ⊕ 4 Particle Y cards
- ⊕ 2 Wild Particle cards



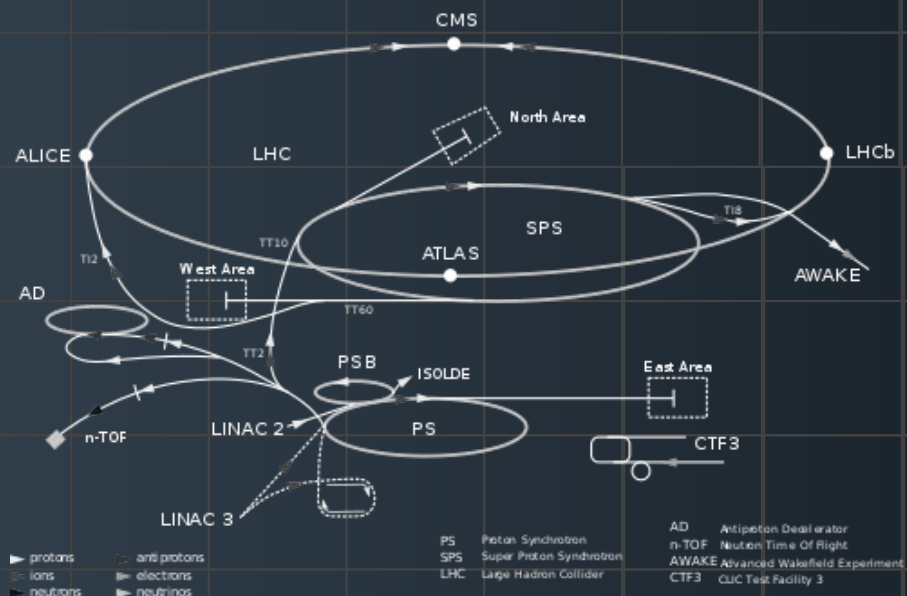
Willkommen / Bienvenue / Welcome to Geneva, home of the Large Hadron Collider (LHC), the largest machine in the world and the only facility capable of discovering new antiparticles! Over the next 20 minutes, you shall perform several very important collision experiments to compete for an exclusive fellowship grant to work at this cutting-edge nuclear research facility.

OBJECTIVE

Collide newly-discovered particles to find their antiparticles. The first physicist to construct a detector grid containing any 5 antiparticles wins the grant to live and work here at the LHC!

OVERVIEW

Each round of experiments starts with an initiator particle, a target reaction equation, and 4 more random particles. Physicists alternate drawing and placing particles and antiparticles from the draw pile into your own 3x3 grid. If you are able to construct the target reaction within your grid, your experiment succeeds; you'll be able to create an antiparticle and conduct a new experiment with 4 new random particles and a new initiator particle. If your experiment fails, you can swap your equation with another in your grid or simply try your experiment again. The game ends immediately when one physicist has 5 antiparticles in their grid.



ANATOMY OF A PARTICLE CARD

PARTICLE (FRONT) ANTIPARTICLE (BACK)

Reaction Direction

Card number

Particle name

Particle symbol

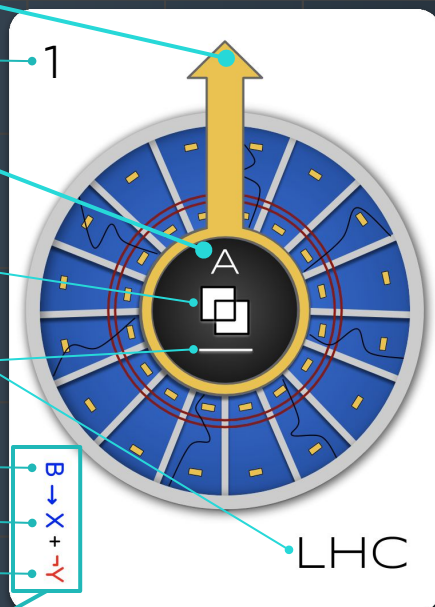
Orientation indicators

Starting particle

Target particle

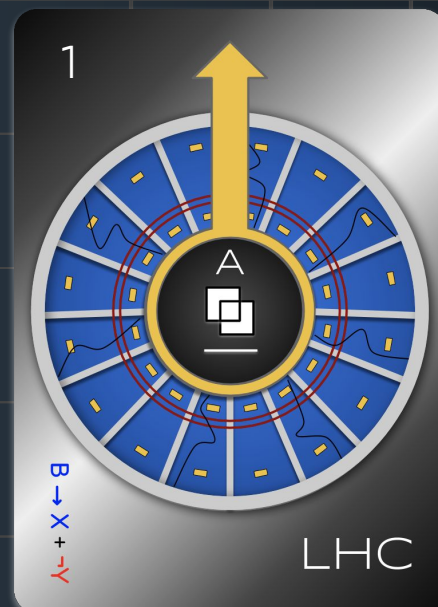
Excluded particle

Target Reaction
Equation



Note: This is a Particle A card. A card's particle will never be part of its Target Reaction Equation.

Note: Wild Particle cards show 2 different Target Reaction Equations per side and have no antiparticle (they're white on both sides). The Reaction Direction on one side is the opposite of the other side.



Note: Other than color, antiparticles act the same as the particle on the other side.

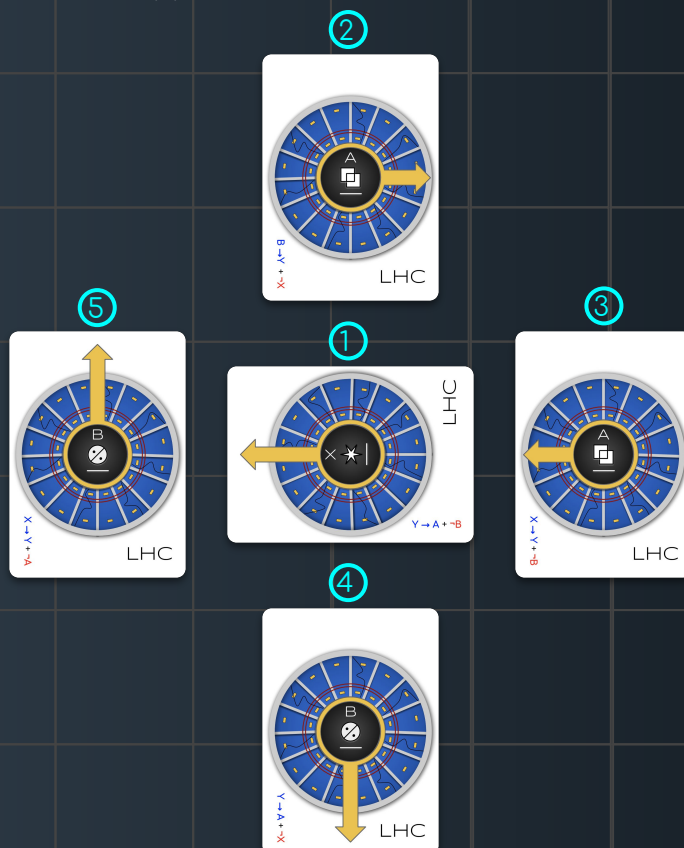
SETUP

Shuffle the particle cards white side up. Deal each physicist 1 card rotated into landscape orientation so the equation faces them. This is the center of each physicist's grid. Starting at the top and rotating clockwise, deal 1 card along each edge of the center card in portrait orientation so the "LHC" faces the physicist. The youngest player starts as the Lead Physicist for the round.

GAMEPLAY

The game is played in rounds with 4 steps:

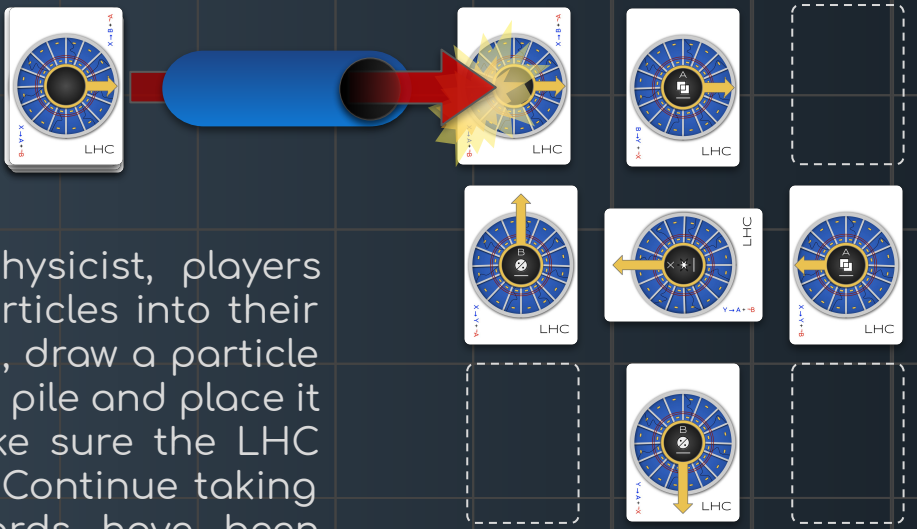
1. Acceleration
2. Collision
3. Creation
4. Detection



Note: Cards always come from the draw pile face up. Shuffle them under the table.

STEP ONE ACCELERATION

Starting with the Lead Physicist, players take turns accelerating particles into their experiments. On your turn, draw a particle card from the face up draw pile and place it within your 3x3 grid. Make sure the LHC text is facing toward you. Continue taking turns until all of the cards have been placed.

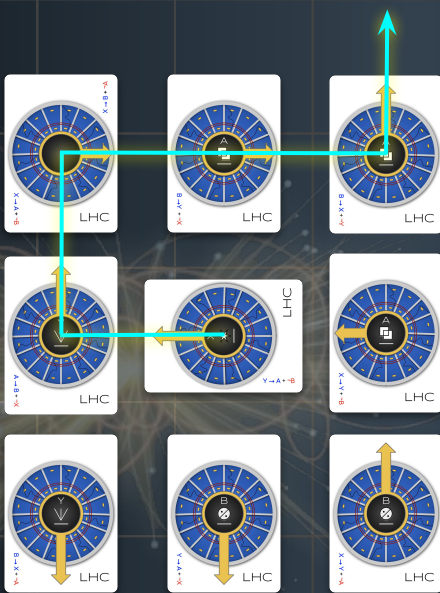


Note: Keep the front/back orientation of the cards as you draw them.

STEP TWO COLLISION

The particles travel in the pattern established in the acceleration step. Starting from the center card, follow the Reaction Direction arrows until they either exit your grid or result in a loop.

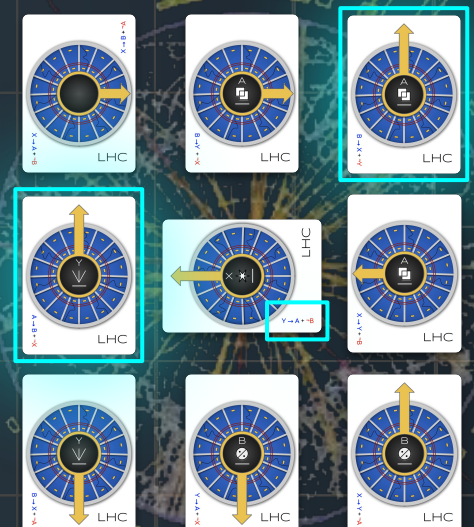
Note: Two Reaction Direction arrows facing each other is considered a loop.



STEP THREE CREATION

If your entire route meets the conditions of the center card's target reaction equation by traveling through the starting and target particles in the correct order while avoiding the excluded particle, then your collision is a success. A successful collision results in the creation of an antiparticle that will be detected in the next step.

Identify the cards involved in the successful collision. If multiple particles satisfy a portion of the equation, you get to choose which one.



Note: Loops can be a useful way to get the particles in the required order.

STEP FOUR

SUCCESS

← DETECTION →

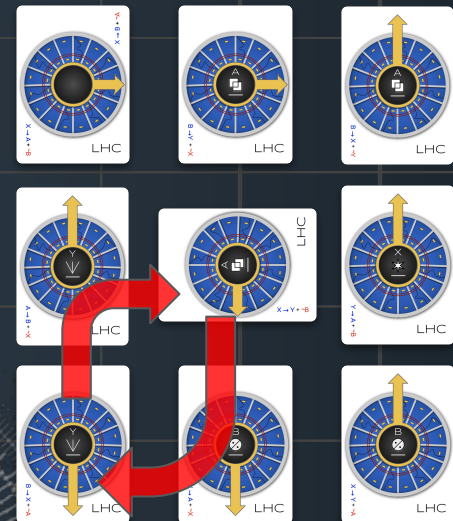
FAILURE

If the collision was a success, you *must* remove the starting and target particles in the collision as well as the center equation from your grid.



Flip one of the remaining white cards to show the black side if possible. Finally choose two additional cards to remove from the grid.

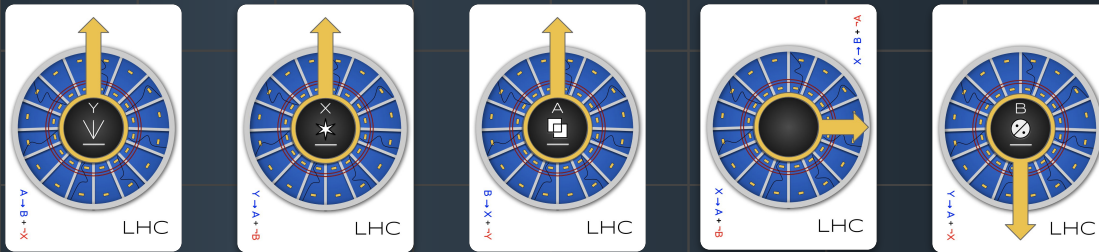
If the collision was a failure, you *may* swap the center equation card with another card in the grid. If swapped, it must be with a card showing the same color (white for white or black for black).



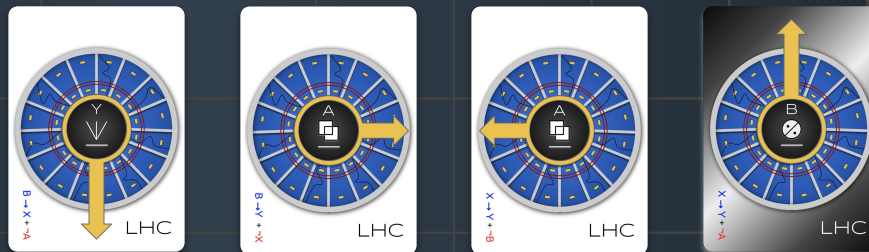
Choose any 4 cards other than the center card to remove from your grid. You may remove a swapped card.

PEER REVIEW

The Lead Physicist shows the other physicist the cards removed from his/her experiment. This will be 5 cards if the experiment was a success. Otherwise, it will be 4 cards. Removed cards may include black cards for either physicist.



The second physicist then reveals his/her removed cards.



The second physicist then gathers up these cards while keeping their current side facing up and shuffles. He/she becomes the Lead Physicist for the next round.

NEW ROUND

Starting with the Lead Physicist, if you do not have a center card, the next card in the particle draw pile becomes your new center equation for the next round. After both players have center cards, begin a new round starting with Step 1: Acceleration.

GAME END

The game ends immediately when a player has 5 antiparticle cards in his/her experiment grid. That player is the winner.

WILD PARTICLES

Wild particles are white on both sides. When accelerating a wild particle into your experiment, you may choose either side as long as you ensure the LHC is facing you. You cannot flip a wild particle if it is your center card, but there are equations on two edges that you may rotate to choose as your target equation between rounds.

