

1 PLAYER AGES 12+

Some of the biggest questions in the world of science may be answered by studying quarks, the smallest of particles. The problem with trying to study quarks is that you can't find just one quark; you need to find them in groups called hadrons, or some other exotic particles, like the Pentaquark.

In the game, you are lending science a helping hand by collecting the 5 quarks that form the Pentaquark at the detector of a massive particle collider.

Move cards you need to the Detector, discard others so they may come back as anti-quarks, and try to minimize the number of quarks scattered and lost. If too many cards are removed from the game, the Pentaquark has slipped through undetected once again!

CONTENTS:

15 Quark Cards (5 flavors in each of 3 colors)
3 Annihilate Cards

REFRESH PHASE

Once the Beam Deck is empty, perform the following steps:

1. Discard all free quarks at the Detector. You may then optionally discard any additional quarks as you see fit. (Note: this will remove the confinement, and that's ok)
2. Discard all of the confined quarks in the Background.
3. Annihilate the remaining free quarks.
4. Check for the loss condition.
5. Add 1 Annihilate Card to the Discard pile, then shuffle and flip the deck, creating a new Beam Deck.

ANNIHILATE

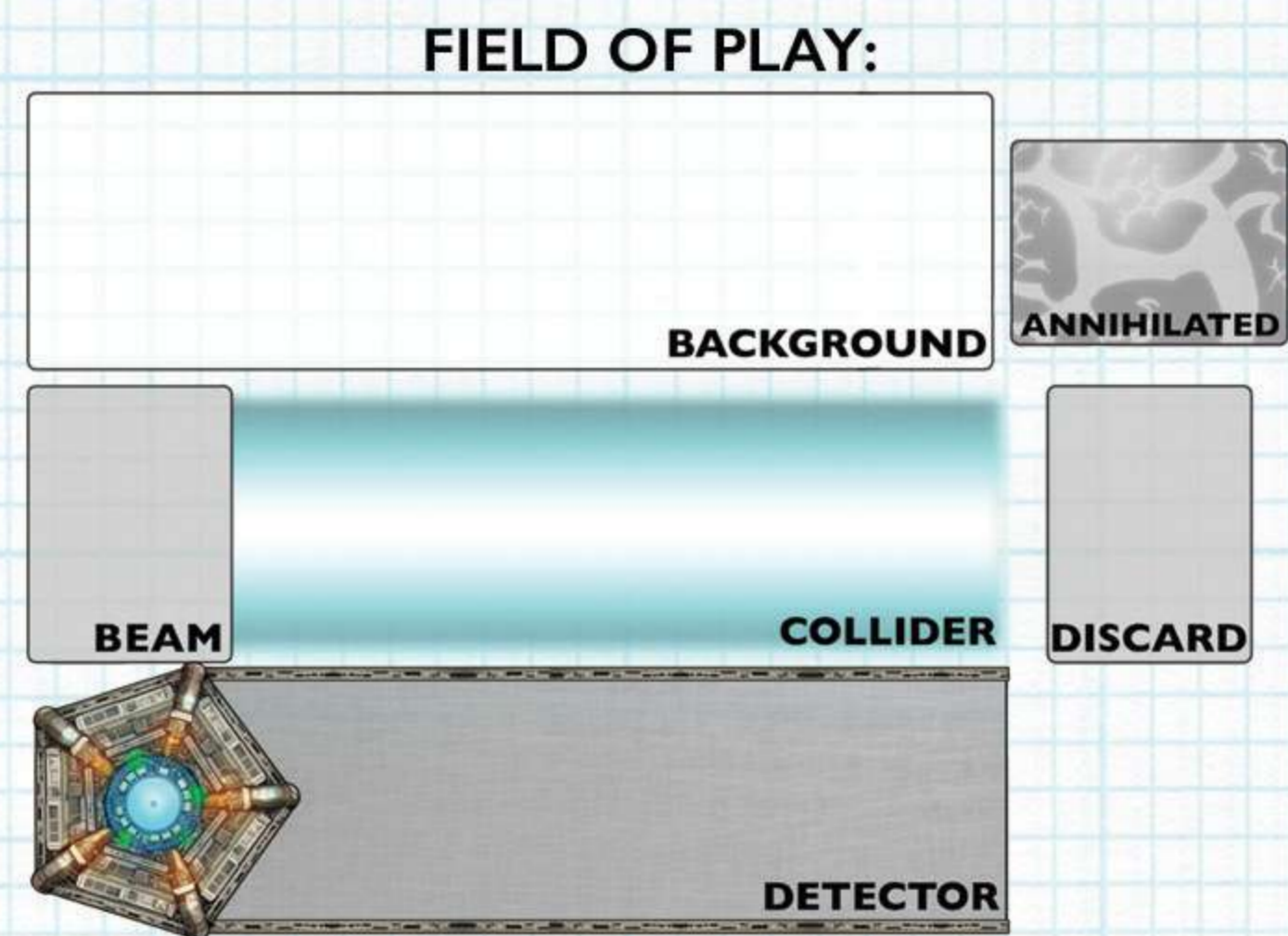
When an Annihilate Card (these are considered Event Cards) is revealed during the Beam Phase, a free quark must be Annihilated and removed from the game before continuing with the Collider Phase. The Annihilate Card is then discarded. (If there are no free quarks, ignore the Annihilate Card.)

GOAL

Detect a Pentaquark before too many quarks are annihilated.

SETUP

- 1 Create the Beam Deck by shuffling the 15 Quark Cards together.
- 2 Cut the deck roughly in half, and flip one half to the reverse side. Shuffle the halves together and place to the left of the play area.
- 3 Place the 3 Annihilate Cards off to the side, to the left of the Beam Deck.



WINNING THE GAME

The game ends immediately if you assemble a set of 5 quarks at the Detector consisting of 2 Up quarks, 1 Down, 1 Charm, and 1 Anti-Charm with the color confinement: red, green and blue and any one color and its anti-color.

EXAMPLE OF A WINNING SET



LOSING THE GAME

The game ends immediately if 2 Up quarks, 2 Charm quarks, or 3 Down quarks are Annihilated. You may also end the game if you realize the correct colors required to confine a Pentaquark are no longer in the Beam Deck.

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2016 Button Shy Games
Rules questions? Visit buttonshygames.com



KEY TERMS

COLOR CONFINEMENT: A quark is considered "confined" if it can be grouped in one of the following ways:

- Three quarks consisting of one red, green and blue.
- Three quarks consisting of one anti-red, anti-green, and anti-blue.
- Two quarks consisting of one color and its anti-color.

FREE QUARK: Any quark in the Detector or Background that is not confined.

ANNIHILATE: A quark is removed from the game by placing in the Annihilated pile. This can occur for one of the following reasons:

An Annihilate Card is drawn from the Beam Deck. A quark & its anti-quark are both present and free at the same location (Detector or Background).

FLAVOR: The type of quark.

- Up (blue up arrow)
- Down (blue down arrow)
- Charm (blue star)
- Bottom (blue circle)
- Strange (blue question mark)

QUICK REFERENCE

BEAM PHASE

Place 3 cards in the Collider

COLLIDER PHASE

Move one card to each of the following, in the order below:

1. Background
2. Detector
3. Discard

Repeat until the deck runs out

REFRESH PHASE

Discard free quarks at the Detector
Discard confined quarks in Background
Annihilate remaining free quarks
Check for loss condition
Add 1 Annihilate, then shuffle & flip the Deck

WIN CONDITION

- QUARKS** (up, down, charm, anti-charm symbols)
COLORS (R, G, B) & any color & its anti-color.

GAMEPLAY

Each turn has two phases, the **Beam Phase** and the **Collider Phase**. When the Beam deck runs out, you will also perform a **Refresh Phase**.

BEAM PHASE

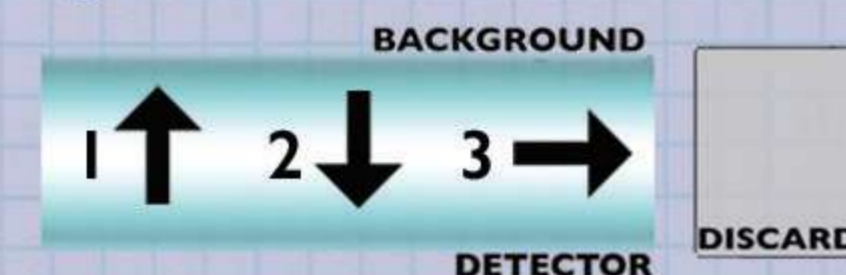
Place 3 cards from the Beam Deck into the Collider.

Note: Cards are not flipped when placed in the Collider, so the top card of the Beam will be the first card placed next turn.

COLLIDER PHASE

Distribute one card to each of the different play areas in the following order:

1. Background
2. Detector
3. Discard



If there are not enough cards in the Collider to complete a step, it is skipped.

At any time during the Collider phase, you may confine free quarks by putting them in the appropriate sets. You may rearrange these quarks freely, even if they were previously confined.

MIKE MULLINS PENTAQUARK A QUANTUM STATE SOLO GAME

