



Curiosity Guide #507

Soccer Science

Accompanies Curious Crew, Season 5, Episode 7 (#507)

To Catch or Parry

Investigation #6

Description

Show

Materials

- Soccer balls
- Goalie gloves
- Goal
- Friend

Procedure

- 1) Take turns being the goalie.
- 2) Have the goalie put on the goalie gloves and stand in the goal.
- 3) The scorer takes shots at the goal.
- 4) The goalie tries to stop the ball.
- 5) Experiment with different ways to stop the ball from going in the goal:
 - a. Catch the ball.
 - b. Strike the ball with the heel of your hand. This is called parrying.
 - c. Hit the ball away with one fist or both fists. This is called punching or boxing.
- 6) How does parrying compare to one- or two-fisted punching?

My Results

Explanation

Parrying the ball means to strike the ball out of the way when the ball can't be caught. Balls shot on goal often have a lot of energy. Energy is conserved and doesn't disappear. Instead, energy gets transferred to the goalie's hand and arm. If a goalie were to parry the ball with one hand, that is a lot of energy striking the hand and could hurt. Goalies prefer to catch the ball. Goalies often go into a roll with the ball to slow the ball down, use their bodies to absorb the energy, or kick the ball out, which transfers the energy back into the ball in a new direction.

If a parry is the only option, think about these strategies. Pretend that the ball is coming from the right side. Now try this:

- shuffle your feet to get to the ball,
- cross over your body to use your left hand,
- turn your body toward the sidelines,
- and follow through the ball with the heel of your hand.

The heel of your hand allows better directional control and is the strongest part of your hand. Always push toward the sidelines with the opposite hand from the direction the ball is coming so the ball doesn't travel back to the striker or in front of the goal.

If you must punch the ball with one or both fists, be sure to have your elbows close to your body and extend into the ball to provide the maximum amount of energy transfer back into the ball. A single punch works to deflect the ball, while a two-handed punch can change the ball's direction. Be sure to parry or punch only when the ball cannot be caught.

Cleat considerations. Have you ever noticed that soccer players wear cleats? How strange that the grass slows down the soccer ball with friction but can be slippery for a player! The cleats provide a lot of traction for the player. In fact, because the cleats penetrate the ground, there is less friction and more resistance for the player to push off against and spring forward more quickly. The same thing happens with large cats like the cheetah. A cheetah uses its claws to get traction when it runs. The cheetah has built-in cleats, but I'm not sure I want to play soccer with one!

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