



HOCKEY STEM

SKILLS CHALLENGE

MAY 2020



SLAPSHOT CHALLENGE

Professional hockey players have recorded slapshots as fast as 100 MPH (160 KM). They make it look easy, but there's a lot of science behind this famous hockey shot! Let's take a look at the physics at work in the slapshot, and explore ways that science can help improve our shots:

THE PHYSICS BEHIND IT

Put simply, a slapshot is the transfer of energy from player to stick and from stick to puck. At every stage of the shot, the forces of the physics are at work.

SLAPSHOT CHALLENGE

STEP 1: BACKSWING

Players wind up, swinging the stick behind them in the air. This gets the stick into position to begin the shot.

STEP 2: DOWNSWING

Players swing the hockey stick back down towards the puck, transferring energy from their bodies to the stick to generate stick velocity (the speed of something in a given direction). The higher the velocity, the greater the force the stick will apply to the puck.

STEP 3: THE SHOT

The player's stick hits the ice a few inches behind the puck first, bending the flexible stick blade for greater "snap." As they make contact with the puck, the player rotates their torso, shoulders, biceps, and forearms in order to swing through the shot, transferring momentum (mass and velocity) from the stick to the puck.

- **HINT:** Because momentum involves both velocity (the speed of the stick) and mass, some pros say the key to this step is shifting their weight from their back legs forward, pushing through to the stick in their hands -- not just swinging like a baseball bat.

STEP 4: THE RELEASE

Leveraging momentum and stick bend, players release the puck from the end of the stick. It is in this stage that the energy is transferred to the puck.

STEP 5: FOLLOW THROUGH

The player continues the swing of the stick all the way through the shot, even after the puck has left the stick. This, together with the curve of the blade, determines the puck's spin and is important for directing and controlling the shot.