

SciGirls Activity 9

Slap Shot!



Icebreaker:
You'll flip out (and so will the quarters) when you Free Fall!



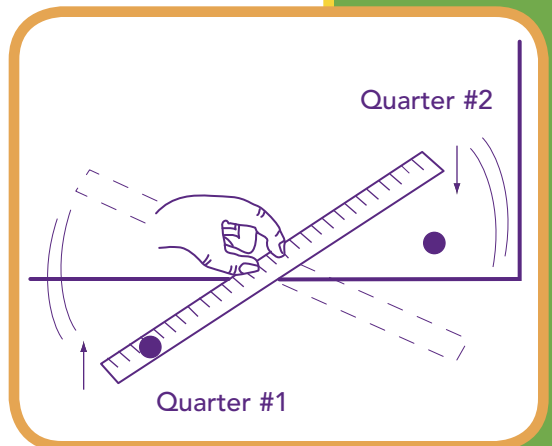
You'll need:

- two rulers
- two quarters
- the edge of a table

SciGirls Skill: Predicting

Guide your girls as they:

- 1) Slide one quarter to the edge of the table.
- 2) Lay ruler so it lines up diagonally to the table edge, one end hanging over, the other end touching the first quarter.
- 3) Put the second quarter on the end of the ruler hanging over the table. Before moving on to the next step, have the girls predict which quarter will hit the floor first... the one that shoots out sideways, or the one that just falls straight down.
- 4) Put your finger on the first ruler, pressing it onto the table, then use the other ruler to give it a good whack, hitting it near the end that hangs over. Watch those quarters fly!
- 5) Listen carefully! Which quarter hits the ground first? Why?



SciGirls Suggestion: Three or four girls per group is comfortable; kids can take turns whacking, recording, and analyzing.



This activity rules! For more information, go to http://pbskids.org/dragonflytv/superdoit/free_fall.html

Investigation: Hockey Stick Power!

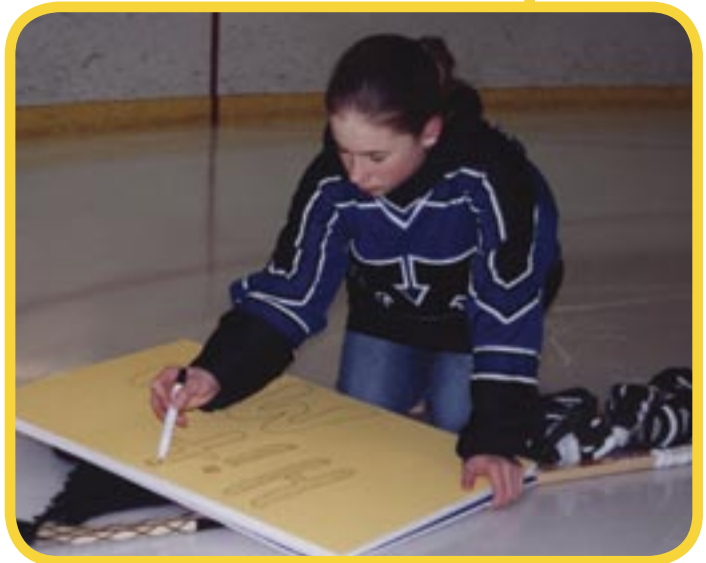
Your girls can “flex their muscles” with this hockey stick investigation.

We’re “ice queens” Tess, Alison and Christina, and we wanted to check out some slapshot science. Most hockey sticks are made of wood, but there are different levels of flexibility. Our SciGirls question: **How does a hockey stick's flex affect our shooting power and accuracy?**



For each group of three girls, you'll need:

- hockey rink
- hockey net, pucks and sticks of different flex ratings
- tape measure
- paper target to place in the net
- sports radar gun (such as the SpeedChek 2000™)



For more information on this investigation, skate over to pbskids.org/dragonflytv/show/hockey.html. Then surf to pbskids.org/dragonflytv/contact/index.html to tell us about your investigation.



Check out this investigation on Tape 2, Segment 9.



SciGirls Want to Know: How does the flex rating of a hockey stick affect the speed and accuracy of my shots?

Guide your girls as they:

- 1) Select a shooting distance for wrist shots, such as between the goal and the blue line (approximately 10 meters). Place a target in the goal; the target can be a rectangular piece of cardboard, approximately 30 cm x 50 cm, or other size of choice.
- 2) Each player shoots 10 wrist shots at the target with the first stick. Record the number of times out of ten the player hits the target. Continue with next stick, again taking 10 shots. Repeat with final stick.
- 3) Set up a sports radar gun behind the net. Each player takes 10 slap shots into the net, recording the speed indicated by the radar gun. Calculate the average from each of the sticks used.



SciGirls Secret:

Hockey is now such a popular sport with girls that most of your group probably cannot remember a time when it was an "all-boy" activity, let alone think of a world without sports stand-outs like Mia Hamm or Marion Johnson! Have your girls brainstorm about other great female athletes, either famous or in their own community. Encourage them to discuss what makes these girls and women so powerful, and what they have to offer as role models. Then have them create a list of sports where girls and women are still not encouraged or even welcome, and have them think about solutions for these situations.





SciGirls Synthesize: Data and Analysis

Here are Tess, Allison, and Christina's results. You can use their table as a model, and fill it in with your own data.

Player	60-flex		75-flex		90-flex	
	Accuracy	Speed	Accuracy	Speed	Accuracy	Speed
#1	50%	39 mph	30%	40 mph	50%	36 mph
#2	30%	29 mph	40%	29 mph	40%	29 mph
#3	40%	33 mph	70%	32 mph	20%	30 mph

See Appendix A for a graphing example.

Conclusion:

The DFTV girls first thought that the higher flex rating would result in a higher shot speed. They learned that the added benefit of the greater flex force of the stick is only useful if the player is strong enough to make the stick bend during the shot. They concluded that choosing a stick depends largely upon the player's skill and strength. What did you learn?

Keep Exploring!

Ever read the printing near the air valve on a basketball: "Inflate to seven pounds?" What does that mean? What it means is that the pressure inside the ball should be seven pounds per square inch, not that the ball should weigh seven pounds. So does pumping up a ball change its weight at all? Get a basketball, football, or volleyball, an inflation needle, a scale that can measure up to 2000 grams, and an air pump. Put the needle in the ball and let most of the air out. Weigh the ball. Pump in five strokes of air; weigh the ball again. Add another five strokes, re-weigh, and continue until the ball is properly inflated (not too mushy, not too hard). What did you notice about the ball's weight? What does this tell you about air?