May the Best Force Win

Summary

Sports activity stations will help the student observe and understand that the greater the force applied to an object, the greater the change in speed or direction of the object.

Materials

Soccer ball
- Sports That Push and Pull pdf
- Forces and Motion in Sports pdf
- Class Survey of Forces and Motion in Sports pdf
- Bob Goes Adventuring pdf

10 sets of sports equipment
10 clipboards
10 pencils
Timer
Whistle

Background for Teachers

This activity will be done after all other teaching of 3rd Grade Science Standard III has been taught. Students will already understand push and pull. They will understand that force affects speed and direction.

Intended Learning Outcomes

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning.

Instructional Procedures

Invitation to Learn

Set a soccer ball on the floor and stare at it. When someone asks you what you are doing, tell them that you are playing soccer. If no one asks, wait until someone says anything at all and say, "Shhhh, I'm doing something." Then they'll ask what you're doing. Of course they will make some sort of argument. Launch into a discussion about what else you would need to do to play soccer.

Instructional Procedures

Beforehand, setup 10 stations for the students to go to, each with one sport activity. The equipment can be real or toys. You must include at least two sports from each category on the *Sports that Push and Pull sheet*. You may set up inside or outside. Make sure the stations are numbered in some way, so students know where to go next. Leave instructions for any sport that you think the kids might not be familiar with.

In the classroom, divide the students into 10 groups (2- 3 students per group). Pass out a pencil, a clipboard, and one *Forces and Motion in Sports* paper to each group. Have the students put their names at the top and listen while you explain the directions.

Explain that when they get to a station, they are to write the name of the sport in the left column before they play with the equipment. Then, they are to use the equipment to do the sport. While they are playing, they need to pay attention to what kind of force(s) they use to play. Tell them that they will have three minutes to play with the equipment. When you blow the whistle, they

are to take one minute to finish filling out the rest of the row for their station. Then you blow the whistle one more time, and they are to go to the next station.

Explain that to fill out the sheet, they must mark either the pull or push box, or both, in the middle column. Then they must write a simple phrase to explain the pull/push force that they used. Example for volleyball: push when my hand hit the ball OR my hand pushed the ball.

Take the students to where you've setup the stations. Send one group to each station and tell them to start. Time them for three minutes, and then blow the whistle. Make sure they are writing. Give them about one minute to write, and then blow the whistle again so they go to the next station.

When each group has been to all the stations, clean up and go back to the classroom. Put *Class Survey of Forces and Motion in Sports* on the overhead projector. Write the sport name in the left column and ask who thought it was push, pull, or both. Tally for each sport.

Discuss the results with the class.

Extensions

Make a list of all the Summer Olympics events. This is especially powerful if it is an Olympics year. Then sort them into push, pull, or both.

Disabled athletes are able to compete in various sports using assistive devices or other technologies. Have students do research and share their findings. Disabled athletes could be invited to the classroom to talk to students.

Family Connections

Send home an assignment as homework where the student and their family get together outside and each throws a ball as far as they can. If they don't have older/younger brothers and sisters, other neighborhood folks can join in. Have them record the age of the thrower, and then how far they threw it. Then they must explain to their family how the littler kids didn't throw the ball with as much force as the bigger kids, so it didn't go as far.

Send home a copy of the *Forces and Motion in Sports* paper for the students to fill out with their family. They may not include any that you had as a station at school.

Assessment Plan

Give the students each a copy of *Bob Goes Adventuring*, a green crayon, and a purple crayon. Tell them to read the story and put a green circle around the words every place they read about a push, and a purple rectangle every place they read about a pull. Remind them that some places might have both a green circle and purple rectangle. For example, when they read about Bob swimming, they will have a green circle for his legs pushing his body, and a purple rectangle for his hands pulling his body.

Have the students choose three of the sports they participated in during the activity to write about. In one paragraph for each sport, have students explain how different weight and different amount of force affects the play of that sport.

Bibliography

Research Basis

Lewis, V. K., & Shaha, S. H. (2003). Maximizing learning and attitudinal gains through integrated curricula. *Education*. 123, 537-547.

Three studies were done comparing integrated curriculum versus single subject curriculum. It was shown that integrated curriculum was significantly better for learning and student attitude. Students were engaged, cared about the lesson subjects, and were able to retain learning better. Three different subjects were used during the study.

Fitton, N. (2004, August). Physics on the playground. *Instructor Magazine*, August, 58-61.

This article shows how to integrate physics with physical education. Subjects include gravity, momentum, friction, force, etc. Short activities are listed.

Authors

Utah LessonPlans