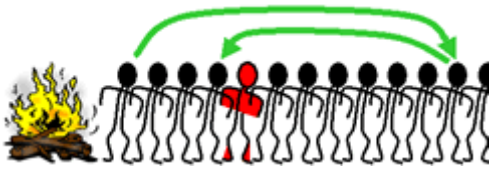
Cold Potato

Katrina and her class are on a camping trip. Today, everyone gets a single potato for supper. It's not much, but at least they should be nice and hot. However, one potato missed being put in the fire. This potato is cold!

Katrina's class forms a line starting with Katrina at the campfire, but somehow a werewolf happens to slip into the lineup at position 5. The children can toss the cold potato 8 people (left or right) using an underhand throw or 11 people (left or right) with an overhand throw. Is it possible for the children to force the werewolf to hold the cold potato?



An example of Katrina tossing the potato 11 people to the right...

Extension:

A year later the children have become stronger and decided to try the same game with the werewolf. They can now throw the potato one more person with their underhand and overhand throws (9 people and 12 people respectively). Is it possible for them to force the werewolf to hold the cold potato?

The next day the children decided to try the game, but, this time they decided that they would allow the potato to be kicked as well as thrown. If the children could all kick the potato 20 people and their throwing ability remained the same (9 and 12 people with the different throws) what is the fewest number of people in the line so that is possible for the werewolf to hold the cold potato?

Cold Potato with a frog hopping theme

The Math in This Problem:

In this investigation, students will be introduced to the fundamental principles of modular arithmetic, which involves working with a system of mathematical operations. Using addition and subtraction, along with division and remainders, this problem is a simple investigation for gaining an understanding of how combining operations can solve various problems.