



Topic **Problem Solving (Visualization)**

- Objectives
- Devise alternate solutions to a problem.
 - Check viability of different methods.
 - Deconstruct success to document solutions.

Duration 15-20 minutes, depending on group

Assessment Type Diagnostic

Students can be conditioned to think that there is a single 'right' answer to every question. This fun activity challenges them to see more than one way to solve a problem. We all sometimes forget that finding out what doesn't work is as important as figuring out what does work! Typically, one group will let the others know they have completed the task, so the others will start to look their way... That's not cheating; it's called 'doing research' and is very much a part of how science really happens.

Set-up

In advance, prepare ropes for distribution to each student. Cut sturdy, but soft, rope into 5 foot lengths and tie a slip knot at each end to make 2 loops.

Assign 2 students to a team; can be a group of 3 if there's an odd number of participants

Materials

- 1 rope with loops per participant

Instructions

1. Place the loops of one rope over your partner's hands.
2. Hang the other rope over the one your partner is now wearing. (Refer to image at right).
3. Place the loops of the second rope over your hands.
4. Without cutting, untying, or removing the loops from your hands or your partner's hands and without untying the knots, get the ropes apart!



Notes

The method for getting free is very simple (see image at right).

Take the rope that is on top and make a loop.

Push this loop through the back side of the loop on your partner's opposite hand.



Move among the groups as you may need to give hints to help students visualize solutions.

Slip knots allow the loops to be adjusted to fit comfortably and snugly around each wrist.

Timesaver! Keep your prepared ropes for the next faculty/staff development meeting or club celebration!

If a couple of teams happen to figure it out before the others have a chance to explore enough, loop them together for an additional challenge. The solution is the same and this can be done with as many people as you can 'rope' together.

Although colorful and fun, most yarn is too flimsy for this to work well; different colors of the heavy yarn are good for younger students, but the activity may be too advanced for them to figure out on their own. Cotton clothesline is usually the best option in terms of weight and softness.

Discussion Questions

- What methods did you try at the beginning of this task?
- What method did you use to finally get the ropes apart?
- What could you have done to escape faster?
- How is this science?

Reality Check! Evaluation

- Did students follow the rules?
 - Did they properly set up the task?
 - Did they not tamper with the loops?
 - Did partners work together to find a solution?
- Did partners test several approaches for separating the ropes?
- Did teams share ideas to come up with additional possibilities?
- Could students explain how to solve the problem to others?

