

STEM Classroom Activity

Air Express

A. The Problem

Your problem is to create a device, powered by air escaping from a balloon, that will travel as far as it can along a stretched line. You will have three attempts to accumulate score. In addition, your device will attempt to break a balloon target.

B. Limitations

1. The only power source allowed is the air released from one balloon. The inflated balloon must be able to pass through a 10" diameter hole cut in a piece of cardboard. The balloon may not exceed 10" in any direction.
2. The device must be self-propelled. It may not be thrown, pulled, shot, etc.
3. You may use any materials to make your device.
4. You may add or remove things from your device between attempts.
5. You will have three attempts to accumulate score. The attempts will be to travel as far as possible and try to break a balloon target. The farther your device travels, the higher your score.
6. Only the two longest attempts will count; however, if the balloon target is broken, that attempt must count for score.
7. During a scoring attempt, the device may not come in contact with anything other than the line or the target balloon. If it touches the floor, a wall, a person, etc., it will be measured from that point. If it becomes unattached from the line, it will be measured from where it became unattached and not where it lands.
8. You may remove the line in preparation for your attempts; however, it must be replaced in position before each attempt. You may not touch the target balloon.
9. Once the device has been released, it may not be touched again until that attempt is complete.
10. Only one balloon target will be provided for each team.
11. Scoring will be as follows:
 - a. Longest distance traveled (1 point for every 6 inches).
 - b. Second longest distance (1 point for every 6 inches).
 - c. If the device touches the balloon target but does not break it, 10 points
 - d. If the device breaks the balloon target, 25 points

C. The Competition

1. Be sure to place the target balloon in the same position for each team. Tape it under, but not touching, the line.
2. When scoring for distance, the device must travel the next full 6" increment in order to receive the point. Do not round off to the nearest measurement. Measure from the most forward part of the device to the farthest point on the line the device travels.
3. The line should be a smooth string or monofilament fishing line approximately 30' - 40' in length.

D. Alternate Problems

1. For younger students, you may set up the line so it slopes downward. The balloon target may be 24" lower than the starting end of the line approximately 30' away.
2. You can have an advanced competition for the device that travels the farthest, the fastest, or that breaks the most consecutive balloons.