

-----

Some notice about what will be different in the actual event:

- The light will be blocked during the planning time.
- Supervisors will not offer assistance or coaching if teams are having difficulty..
- Supervisors will tell you about the remaining target ONLY IF students ask. Students can ask to be reminded where a target is, or they can ask which targets they have not hit yet.
- The relay will stop at 2 min, even if not all targets are hit by then.
- During the workshop, we were not as strict on stopping the count and restarting when the light wandered off. However, on the event day, steady illumination is required until you hear “next”. We are looking for the target to be illuminated for 3 seconds and are using a metronome in the room to make counting consistent.
- The event room may be a bit larger than the practice room. However, we will not be able to tell you ahead of time. Therefore, it is important to practice in a different setting.

Suggestions for Photon Phun practice:

Envision a zig-zag path, not a straight line. We never want three points to be in line, including the light, so make sure the second person is not also in line with the light source, or that the second and third person are in line with the target.. During practice sessions, a coach could set up the targets, and the students could work on each one on paper before they physically try the light relay.

While the targets are generally ordered from easier to harder (1 being the easiest), it may help to go out of order in some cases. Specifically, if you recognize that multiple ones can be hit easily with minor modification in the positions. Strategizing should be a part of the practice.

Tips for everyone:

- We thought the teamwork during the workshop was really good, so keep it up! Emotions will be heightened during the competition, so try your best to foster a friendly environment and don't put special emphasis on winning.
- Make sure to maximize the 1-minute planning time. Tell the students what they should do during this time, and help them memorize it. Certain things on the list could be seeing which targets are close together and could be hit in one formation, figuring out an order that they will do the targets in, and getting into the formation they plan on being in for the first target.
- I would designate each student to a role (1st person, 2nd person, 3rd person) because it is faster if you know where you are going. Of course, this does not have to be set in stone, and being flexible can be beneficial (for instance, if two targets can be hit in the same formation but switching the 2nd and 3rd person). The first person needs to watch two things: they need to make sure they are catching the light from the flashlight and also sending it where it needs to go. A lot of people were not catching the light from the flashlight, so just make sure that they keep checking that they are still reflecting the light. This is especially important to check when

the team switches from one target to another, as there is a tendency to drift away from the flashlight beam as you turn slightly.

- Focus on YOUR target, which may be another student. Looking at anything else (including the relay target if that's not YOUR target) can distract you, making it difficult to keep the light where it needs to be.
- Keep the distances as short as possible. The longer the light's path is, the weaker the light gets, making it more difficult to hit the target. Remember, the supervisors need to be able to see the light hitting the target. If it is too faint, then we will not be able to tell.
- Communication is important. You can talk normally — no need to whisper.
- Tuck your arms against your body (to steady the mirror), and hold the mirror on the edges. Make sure that the fingers are not 1) covering the mirror or 2) sticking out beyond the mirror so as to make a cast shadow. This could be practiced individually. If you see the shadow of your fingers on the reflected light (and not square, rectangle, etc.), you are losing some light.
- If you need to hit a target from below or above, you need to tilt the mirror vertically also. It is easier if you first get it in the correct line horizontally, and then adjust the angle vertically as you follow the light toward where it needs to go. It will also be helpful if the 2nd mirror tilts the mirror in the opposite direction slightly, which makes it a zig zag in the vertical direction. For example, if the target is on the ceiling, then if the second person tilts their mirror down it will be easier for the third person to send the light up

#### A tip for the students reflecting:

- Think about where you need to stand that's as close as possible to the flashlight.
- First, catch the light by your torso (you can see the light better on your clothes). Center the light on your body, and then place the mirror near the center, which may be higher or lower than your waist, depending on how tall you are.

#### Additional information for those who were not able to attend:

- While we will have a different configuration at the actual event, the target positioning we used may assist you in planning the practice. The flashlight was in one corner of the practice area. The first two targets were on the wall in positions that were relatively easy to hit. The third target was on the floor, and the fourth target was placed higher (maybe ~6 ft). The fifth target was placed at the bottom of a hanging cabinet (so it needed to be hit upwards). The sixth target was above the ceiling where a ceiling tile was removed. Other more difficult configurations could include inside of a cabinet with doors obstructing it or under a table (so again you have to hit it from below).