Write It Do It
Tips And Strategies

Authored by Rich Lund 2014
www.youtube.com/MrLundScience

Introduction

Write It Do It focuses on two often overlooked, yet vitally important skills that all scientists need: **effective communication** and **interpretation of instructions**. Realistically, in all fields of science, we must be able to communicate our results to the public, our peers, and (especially if we want that funding) our superiors!

In addition to this, what shall be described is locations, orientations, and positioning, in all **three dimension**, which is not a skill that has been practiced, even by seasoned high school writers. Not only are such descriptions important, but, they must be given with much consideration to the most logical sequence to write the instructions that allows the materials to be put together properly.

You Must Speak The Same Language!

To make things easier, we will refer to any set up in WIDI as a "**layout**" from this point forward.

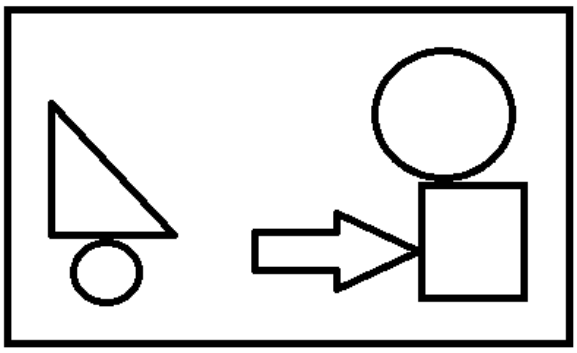
WIDI students like to jump right in and start with an exercise where one writes, and the other then does. It's not a terrible idea, but it is **very useful** for the two to "get to know each other" first and describe some layouts together. By listening to each other **verbally** describe a layout and how you would write instructions for it, both the writer and the doer will "get a feel" for what language they both tend to use, and make already some observations as to what language is more useful.

During these exercises, it's good to warm up with verbal descriptions, but eventually, pull out some paper and in an untimed session, list all materials, and then describe **together** in a written format, how they should be assembled.

Improve Your Language!

During such exercises as described above, it can be noticed that some ways of describing things are going to be more advantageous than others and result in a more accurate rebuilding of the layout.

Consider the **simple** diagram to the right. →



When describing the layout, early mistakes that could be made might include:

*"The triangle should be placed **above** the circle."*

However, in many situations, there will be a three dimensional layout to build, and the word "above" could be interpreted as "on top of" rather than "north of".

It is already an advantage to use compass terminology (north, south, east, west) when describing positioning that is on the same level, whereas "above" or "below" can lead to misinterpretation.

You might also notice that in the above statement, it was not indicated **which** circle. Students might look at such a hypothetical diagram, and not realize that **MORE ITEMS THAN WHAT ARE IN THE LAYOUT MAY BE GIVEN TO THE DOER!**

To make this point clear, imagine the writer describes the following:

"The triangle is to be placed north of the smaller circle, so that the circle touches the triangle in the middle."

At first, this might sound fine, but what if an **extra triangle** is given to the doer that isn't actually to be used? If the doer walks into the room and found two triangles → they wouldn't have an indication as to which should be utilized in the building of the layout.

Useful Terms

Writers and Doers should **discuss, understand, and utilize the following:**

Adjacent	Plane	North of	Extending
Tangent to	Layered	South of	Bridging
Isolated	Alternating	East of	Joining
Rectangular	Repeating	West of	Parallel
Triangular	Base	Circular	Perpendicular
Acute Angle	Square	Cylindrical	Separating
Obtuse Angle	Circular	Symmetrical	Above
Right Angle	Hexagonal	Surrounding	Underneath

The Material List!

BEFORE beginning instructions on building, the writer should make a **materials** list! This is VITALLY important, as in many competitions, the event host will give the doer EXTRA materials that are not actually to be used in the layout construction. At time, those "extra" materials might be VERY SIMILAR to materials that should be used. Thus, a materials list **should contain some amount of detail of each item**, especially color if an item could be described with a color.

Imagine, for example, a red "bouncy ball" is used in the layout, and when the doer enters the room, amidst the possible materials are three bouncy balls, one red, one yellow, one green. If all that is on the material list is "one bouncy ball" that can be an issue.

There are even times where layouts included golf balls of ONE brand, and the doer was given golf balls of various brands to possibly use.

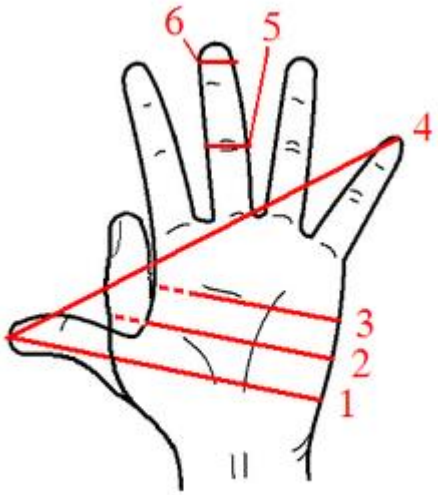
Measuring Distance – Show Each Other Your Hands!

You do not get to take in and/or use a ruler, but that does not mean you can't use measurements. The writer and doer should come up with a system for measuring distances that makes sense to the two of them. And, what tool will you ALWAYS have at your disposal? Your hands!

The writer and doer should compare hands, fingers, knuckles, etc., and be able to come up with some conversion factors if necessary. If the two of you have similar hand/finger/knuckle sizes, great. If not, figure out some conversion factors, such as:

1 writer palm length = 6 doer index finger widths

The diagram to the right → shows some common lengths that could be "defined" by the writer and doer. (Feel free to discuss and develop your own, too.)



However, **YOU ARE NOT ALLOWED TO USE CODES IN YOUR INSTRUCTIONS!**
Thus, you could not say
"Place the golf tee palm length #2 east of the cup"
because "palm length #2" would be considered code.

If you have discussed it first, though, and you both understand the terminology, nothing prohibits you from stating "Place the golf tee palm length including thumb east of the cup."

The writer should use such terminology, but if so, make sure that you have compared hands and that the doer can translate "palm length including thumb" into their OWN hand units!

Writing The Instructions (The WRITER)

GROUP your Materials List!
If there are some materials that in the layout "go together", meaning they WILL be placed near each other or part of a specific construction, make not just ONE list, but multiple, logically grouped lists. This will help the doer organize their items later before construction!

Use NUMBERED STEPS!
After a materials list, I can't stress enough the importance of USING NUMBERED STEPS in your instructions!!! The writer must understand the difficulty of the task from the doer's point of view. Numbers steps greatly helps the doer keep things organized. This helps the doer understand when a major task of the building is finished and we are on to a new step. Numbered steps also help organize the sentences into OBVIOUS groups so that a sentence isn't accidentally misinterpreted as the start of a new step when it is actually the end of a previous step.

In numbered steps, this can also help not confuse the use of pronouns. If the word "it" shows up in a numbered step, it is much more obvious that "it" refers to the major item/material of that step. If instead "it" is used throughout one large block paragraph, and multiple times for many things, it can be difficult for the doer to distinguish "it" from another "it" that was used, **especially** if they make a mistake and need to go back to previous instructions!

Using Abbreviations
As per the rules, abbreviations can ONLY be used if they are defined somewhere in the instructions, either before the instructions begin, or within an actual step, and the defining of the abbreviation must show up BEFORE the abbreviation is then used. Thus, if I wanted to abbreviate the word abbreviation (abbreviation = abbr.) then what I just did in this sentence allows me to now use that abbr. From then on, use of "abbr." to signify "abbreviation" is legal.

If I DIDN'T do that, then each time I used abbr. without a definition would cost 1% of the total possible score points!

Describe Items AS THEY ARE, Not As YOU Know Them!
Perhaps chess pieces are used somewhere, and the writer knows chess. Does your doer? If you're not 100% sure that they do, describing where to place a "bishop" might cause problems if the doer doesn't know chess! Describe items as they are in a language that assures your doer will understand it **without** prior knowledge!

Writers Should Think About Construction!
Hopefully it goes without saying that the ordering of your steps should be thought of in such a way that the doer can easily build the layout. Thus, usually (though exceptions exist) it is more effective to describe and instruct the building of the first "layer" of a multi-layered, three-dimensional design.

Is TIME Important?
For the WRITER, **NO!!!** There is NO advantage to writing your instructions quickly! In fact, there is the **disadvantage** that you didn't use that time to even more accurately describe your materials, their positions, their orientations, and to proofread what you did write.

Writers, when they first start out this event often are impressed with themselves that they finished their instructions with, say, ten minutes to spare…and then the final layout constructed has multiple mistakes that *could have been prevented* if instructions had been more detailed.

Time is used for a tiebreaker in **CONSTRUCTION** but is not used as a tie breaker for the writing portion. DO NOT RUSH through your writing!

Constructing The Layout (The DOER)

Basic Tips

- BEFORE construction, group your items into the groups your writer has advised. During this time, you will also (hopefully) be able to identify any "extra" materials that are not needed.
- As you construct, keep your layout in the **same orientation**! You might be surprised how often mistakes are made in a time pressure situation (20 minutes) where the doer rotated the layout to build something, and then forgets to put it back the way they started (and the way the writer wrote about it).
- If time is allowing you to do so, **double check your work!** Mistakes can sometimes pollute later constructions and get you off track. Proofreading only after you think you are all finished is **not as effective** as proofreading and double checking often as you go! It's better to be only 75% finished with zero mistakes than 100% finished with many mistakes (in most cases).
- Do NOT try and make sense of the materials, nor add your own assumptions. The materials are meant to be very random. Just because, say, LEGOs are used, that doesn't mean that they are necessarily going to be joined together as LEGOs often are. If K'Nex pieces are used, do not assume every piece will be used as K'Nex pieces traditionally are. Follow the instructions without adding in your own ideas!

Practice Ideas

You MUST practice often! There are MANY ways to practice that are helpful!
In most cases, you will need to have another Olympian bring in materials for you to use for a practice session, and the other Olympian will need to set it up for you.

ALWAYS DO THE FOLLOWING:

1. BEFORE you start, **PHOTOGRAPH** the layout from MULTIPLE angles!

2. AFTER you start, photograph the constructed attempt from the same angles. ESPECIALLY photograph mistakes!

3. DISCUSS THE RESULTS!!!!!!!!! This is **the most important part of the practice!** If the two of you don't get together, notice the mistakes made, and discuss ways they could have been avoided/prevented, you WILL NOT IMPROVE nearly as much! It is thus important to manage your practice time so that you have time to discuss the results! Go over the instructions and highlight parts that either could be improved, or parts that should have been paid more attention to. (Use a different color for those categories.)

4. RECORD THE RESULTS!!! Perhaps the second most important part is to record each practice. In a **BINDER**, you should print off before/after pictures, have the original instructions used, that have been highlighted as described in #3. Include notes on what mistakes were made, and how the two of you plan to prevent them in the future.

Performing a "Run"

- **Full Run:** Simulate the exact situation you will face at competition. 25 minutes for the writer, 20 minutes for the doer.
- **Mini-Run:** A full run can take, when all said and done, around an hour, and that's WITHOUT time to discuss the results. Mini-Runs can be very effective, AND supply you with time to discuss the results! Though it can be changed, a good "Mini-Run" time frame should be: 10 min to write / 10 min to do / 10 min to discuss. (The layout should be somewhat scaled down with the understanding that much less time is going to be used.)
- **Reversed Run**: This can be done as a Full or Mini run, but at least a few times, the doer and the writer should switch tasks. This is so that the writer/doer can see and understand things better from the other person's perspective. When a writer has to read instructions that **they** find confusing, it helps them see what the doer might feel like if the writer has not been clear. Likewise, the doer, having experienced building, can better understand the difficult position of the writer, having to write instructions with building in mind. (Reversed Runs are valuable when two people are first paired up, but once two or three have been accomplished, stick with regular Full and Mini runs!)