



# STEMBoost Newsletter

Issue III

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## SO Rule Presentations Under COVID-19

**Joseph Lee**

During September 21, 23, 24, and 28 this year, former and current Gold (senior) Team members of the Kennedy Middle School Science Olympiad gave presentations on each event for students planning to participate in Science Olympiad for the 2020-2021 school year (excluding some devices). Due to various restrictions imposed by COVID-19, presentations were given online.

Although the rules are nearly identical to last year's barring a few minor revisions, the overall flow of tournaments will likely be very different from what participants are used to. Under current restrictions, invitationals will be held virtually, and device events may be postponed. Lab events will likely only include testing portions.

Before the pandemic, the entire team would meet once a week and students would meet separately for specific events. Rules were presented at a weekly team meeting by students responsible for the event within that team. Through this process, everyone gained a firm understanding of the rules and participants were able to socialize and learn to cooperate with their partners by working together.

This year, for everyone's safety, former Gold (Senior) Team members gave presentations via Zoom. Thank you to Amol Rama, Andrew Zhou, Angela Zhang, Aseem Rajopadhye, Ashish Kashyap, Deetshana Parthipan, Dylan Yang, Edwin Xie, Iona Xia, Joseph Lee, and Leela Srinivas. The presentations went smoothly, and new members could get questions answered.

Even in an online setting, understanding the rules is essential to the competition. It is part of knowing how to make the cheat sheet, what materials to bring, and what specific topics to study. For devices, rules about measurements and bonuses are important. As an additional tip, try not to make the test paper a mess or proctors may deduct points! Despite the unique circumstances, we hope that everyone can succeed in competing this year. Go Cougars!

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### Fun Fact

Do all planets spin around the Sun in the same direction?  
(See answer in the back)

## Editorial – The State of Astronomy Within Our Education System

**Ryan Li**

Throughout our hectic daily lives, we often forget to peer at the endless expanse above our head; an unexplored frontier which may be humanity's key to survival. We are so caught up in rushing to school, work, and other places where our presence is needed but can't spare five minutes not only to look up at the sky, but to feel that sense of wonder about how small we are in the universe. In fact, even the supposed fundamental principle of the field, defined by the director of the Westlake Schools Planetarium Jeanne E. Bishop as the, "orientation in space and time and the nature of the universe which lies beyond our planet" have been shown to be greatly misunderstood by the general public. NPR's Scott Neuman reported in 2014 that a survey conducted by

the National Science Foundation from the same year asking 2,200 participants whether the Earth orbited the Sun or the Sun orbited the Earth resulted in 26% of participants answering incorrectly. In an earlier survey conducted in 1988 by the Public Opinion Library at Northern Illinois University the same question resulted in 21% of the 2,041 people who responded getting it wrong. When the 72% of participants who answered the question correctly were asked about the length of the journey, only 45% (918) of the original 2,041 people answered a year (Fraknoi, 1996). This clearly indicates that there is a general lack of knowledge surrounding astronomy, who's potential cause may lie in the limited exposure within grade school.

To observe this, one needs to look no further than the CUSD and FUHSD, both of which are located in the South Bay. For example, the NGSS (Next Generation Science Standards) curriculum in which the CUSD adopted in May of this year only incorporates standards surrounding space systems in the first, fifth, and eighth grades, whereas topics within biology and physics are much more prevalent within the curriculum. This brings up the issue: how is one supposed to find a passion in a subject which is barely introduced in the first place? It is important to note, however, that the two heavily emphasized fields are also very important, with genome sequencing and editing as well as saving the planet's ecosystems from anthropogenic climate change being at the forefront of biology, and along with physics being fundamental for understanding many of the complex interactions between planetary bodies as well as their suitability for life. The problem is that there isn't a lot of opportunity to apply the knowledge, albeit basic, of physics and biology when the curriculum is mainly focused on these subjects.

Even within high school, where more complex physics are being taught, the opportunity to apply this knowledge to the universe beyond our planet has been limited. Among all thirteen of the FUHSD approved science courses, five are physics related, while only two of those five even mention the notion of applying the subject to the universe. These two happen to be the only two non-AP (college level) courses as well. This implies once more that although the topic of astronomy is brought up in school, it is only done so in relatively miniscule amounts and in mostly entry-level courses. There are also specific physics AP courses on mechanics and electricity/magnetism, both of which require a previous understanding of physics, but no such astronomy-oriented courses exist. This shows that a topic which can be relevant to physics can have specialized classes dedicated to them, yet the same isn't done with astronomy. However, it is important to not forget that there is more to astronomy than physics alone. For example, determining the chemical makeup of stars as well as examining if the elemental composition of planets are suitable for life integrates both chemistry and biology, both of which are taught in much greater detail than in middle school, and thus may attract more people who perhaps have less of an interest in the mathematics behind physics. This allows teachers who aren't as knowledgeable in physics to have a greater incentive in integrating more aspects of astronomy into their curriculums, perhaps even creating an entire course dedicated to the subject in high school. In fact, there are many online astronomy courses, including some which are created by NASA and the American Astronomical Society (AAS), which already exist for K-12 teachers (Limón, 2019). The bottom line is that this lack of awareness surrounding astronomy and lack of integrating the various components within it in grade school, which happens to be the time period in which most children don't know what they want as a career yet, could contribute to the overall public astronomy knowledge deficit.

People's viewpoints on astronomy may also have an impact on their general enthusiasm in teaching and pursuing the field; after all, most commercial jobs don't require the need to travel remotely near space. Yet the field of astronomy has brought with it many advances in everyday technology. Shannon Hall of Universe Today states, "Airports utilize advances in technology designed for astronomy. X-ray observatory technology is used in X-ray luggage belts. A gas chromatograph — an instrument designed for a Mars mission — is used to analyze luggage for explosives." This shows that even though studying astronomy may seem pointless to us, it still benefits us not only by giving us an insight into our cosmic surroundings but also assisting with innovation within our everyday lives.

As if that wasn't already enough reason to increase astronomy within grade school, it is almost inevitable that if we continue down our current path with astronomy, it will be disastrous for the future of the human race. Annalee Newitz of Futurism illustrates, "If we've learned anything from the survivors among our ancestors, it's that staying put and fighting change are not good tactics if we want to live. Survivors range over vast regions. If they encounter adversity in one environment, they try to escape and adapt to a new environment. Survivors prefer the bravery of exploration to the bravery of battle." In short, many species who have survived for very long periods of time have moved and adapted to whichever environment they could prosper in; in other words: move, change, or die. As the issues stemming from our ever-growing population, including overpopulation, food shortages, and excess greenhouse gas emissions increase, it may reach a point where we simply can't cope with the effects of our own actions. Space is the only other frontier where we can physically travel to. A lack of exposure to astronomy at a young age can delay the chance that someone may make a groundbreaking discovery surrounding space travel at best, potentially leading to our eventual demise at worst.

Without the knowledge about stars and other celestial bodies prominently introduced to children at a young age, they may grow up without an interest in finding humanity a second home. Even if they do develop an interest from the times when it is in the curriculum, classes which sustain that interest won't be easily accessible, especially with the large workload present in high school. This can lead to a lack of progress in the field of astronomy and prove detrimental to humanity's plan B of colonizing on another planet should things prove unsuitable on Earth. Thus, it is crucial that educators in the United States and some parts of the world recognize the many benefits which come with teaching school children astronomy and take action with increased implementation of astronomy courses within the curriculum. Not only will this benefit life here on Earth through its many applications in daily life, but it will ultimately pave the way to humanity's expansion into space.

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Answer: All planets in solar system spin around the Sun in the same direction except Venus. Venus likes to go her own way.