

Drones in Careers: Firefighting

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The world of drone technology is soaring to new heights, bringing many exciting career opportunities for those who master drone operation and essential skills like teamwork, communication, and creativity. One area where this fusion of technology and skill is making waves is firefighting. Firefighters are the brave defenders of our communities, fearlessly battling flames and protecting lives, and now, thanks to drones, they have a powerful ally in their heroic efforts.

Industry Relevance

When you think of firefighting, drones are most certainly not the first thing that you envision. Team 4400H has decided to talk about the firefighting industry because, to a normal person, flying drones and firefighting do not seem like they relate. To impact the community and their viewpoint, we wanted to focus, research, and report on some unnoticed changes regarding drones in careers, particularly in the firefighting industry. With the recent fires in California, incorporating, coding, and piloting drones to help in their work helps the firefighters get their job done. The drones helping in such an important profession in the community inspire us to keep working on the skills that we learn in the Aerial Drone Competition.

Drones & Careers

Integrating drones into firefighting has completely transformed how emergency responders address crises. These remarkable flying machines are engineered to withstand extreme heat, capturing vital images when every second counts. These drones can be coded to work autonomously just like in one of the missions in the Aerial Drone Competition or can be piloted to fly over the area. With an aerial view of the situation, firefighters



gain unmatched situational awareness, empowering them to strategize and make informed decisions before entering the fray. This partnership with humans and technology is a grand evolution in firefighting.

Drones have become indispensable in helping firefighters swiftly assess the outside and inside of burning structures. Providing real-time data and images that surpass all traditional methods is what drones offer in the field of firefighting. In addition, drones have been used to detect the body heat inside buildings, which helps firefighters complete their missions efficiently (“Firefighting Drones”). This revolutionary capability not only enhances search efforts but also significantly improves the safety of firefighters. Entering a raging inferno comes with inherent dangers, from smoke inhalation to the risk of structural collapse. By utilizing drones to gather crucial information from a safe distance, firefighters can plan their tactics more wisely, minimizing their exposure to harm. This innovative use of technology exemplifies how modern tools can transform complex emergencies, ultimately safeguarding the firefighters and the lives they aim to rescue.

Has there been any recent incidents where drones have been used?

As to team 4400H’s extensive research, the team has found that there have been multiple instances where drones have been used in firefighting missions. Two notable incidents include a tragic event in Kentwood back in 2024 and the most recent incident, a fire that broke out in Los Angeles, California, in the second week of January 2025. During this devastating event in Los Angeles, drones were piloted to fly over the damage and try to find any other fires that could be put out. This proactive deployment allowed them to spend more time extinguishing the fire rather than searching for the location of panic. It’s a prime illustration of how drones are reshaping the firefighting industry. Instead of wasting precious time locating victims or assessing fire situations manually, firefighters were able to hone in on what truly matters, putting out the fire and saving lives.

These specialized drones are not just innovative; they are engineered to withstand intense heat, drastically enhancing the efficiency and effectiveness of firefighting efforts. This unique capability enables teams to respond swiftly, ultimately increasing the chances of saving lives during fire emergencies. The successful use of drones in the Los Angeles wildfire incident highlights their incredible potential, allowing firefighters to focus on their primary mission—extinguishing fires and protecting those in peril.

Are there any specialized drones for search and rescue missions like these?

Some drones are designed to help with certain occupations. One example of a career that uses these specialized drones is firefighters. For

example, as you can see in the picture to the right, this showcases some of the special modifications made to the drone to help firefighters in their field of work specifically. In this picture, you can see that they have installed a small canister filled with

fire extinguishing powder, a night vision camera, and a 30X optical zoom camera. These additional mechanics on the drone help in an emergency to pinpoint the fire faster and to ensure that their mission runs as efficiently as possible. In the image to the right, you can see the side-by-side comparison of how the picture looks without the temperature-sensing camera installed on the drone, and how it looks with the camera. With these two photos together, you can see the extreme differences between the vision of the drone with and without these extra attachments.



Career Readiness

Let's say a student chooses to be a firefighter as their future career, how can they ready themselves for this job? If their school has an Aerial Drone Competition team, joining it will positively impact their traits and identity. By competing in the Aerial Drone Competition, the student will learn necessary skills not just for their career, but for their life as well. Out of the many skills, one example is collaboration. When competing in the competition, the student must be able to work with others on their team despite conflicts that may occur. The student will learn how to resolve problems between peers, communicate effectively, and most importantly, learn how to treat others with respect. Having these skills as a firefighter, and as a normal human, enhances the relationships in your team and daily life, allowing safety procedures to run smoothly.

While learning how to collaborate with teammates is an important skill in the workplace environment and life, there are also other key skills that the Aerial Drone Competition introduces to students. For instance, being able to step up and be a leader. Whether at practices or even during tournaments, a team is expected to have a team captain or representative. Having students practice their leadership skills gives them a sense of responsibility and independence, which is crucial in various jobs and our daily lives. Introducing this concept to students early will strengthen and refine their skills so that they will be ready for their future lives as independent adults with careers with or without drones. With firefighters, there is often a fire chief, who is in charge of being the representative and ensuring that everything is going to plan.

Another skill that correlates with the two before is being able to talk in an interview with confidence. During tournaments, Aerial Drone Competition teams are required to go through an interview with judges and talk about important concepts such as safety precautions, strategies, coding, and the engineering design process. Though these interviews may not seem like a huge deal, the team members participating in these conversations are refining vital skills for their future careers. One way that interviews help the students is by giving students practice and experience in public speaking. As we know, not everyone is a born public speaker. Whether it's

stuttering, lacking eye contact, or seeming anxious, students are not confident when speaking to an audience. Incorporating interviews into the Aerial Drone program encourages the students to strengthen their confidence and professionalism in public speaking as they practice and prepare for tournaments. By having collaboration, leadership, and effective communication skills, aspiring firefighters who were previously in the Aerial Drone Competition are prepared to interview for their occupation and give speeches when necessary.

Conclusion

In the firefighting industry, these missions are high-stakes and you need to risk a lot for the mission to run smoothly. Incorporating drones has helped these expeditions run more efficiently and lower the risk of casualties. With the quickly advancing technology, drones and aviation are making their way into our daily lives. While firefighting is one example of a career industry that is now recently incorporating drones into its career, there is also a substantial amount of other career industries that are starting to use drones daily. The widespread use of technology in jobs is continuing to grow, and it's taking flight with drones leading the way!

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