

## Rhodes Sample A

### Personal Statement

The "spider web activity" at Camp \_\_\_\_ requires a group of ten people to transport each member through a large, black net with holes ranging from  $1/4$  to  $1/2$  meter in diameter. If a body part or piece of clothing touches the webbing, then the group starts over. When faced with this challenge, some groups try to split up and individually maneuver through the holes. But going alone is harder than it appears, and typically only one or two people make it to the other side before someone touches. If the group lifts each member individually and passes him through, then it can transport the entire group to the other side without touching the net.

During the eleven summers that I have attended and worked at Camp \_\_\_\_, activities such as this one have influenced my ideal of effective group membership and leadership. I have learned to lead by example, actively listen, and regularly meet with co-workers to discuss personal well-being and group dynamics. When leaders are sensitive to the group's needs, its members can work together and make even menial tasks fun. Cleaning dishes can be a boisterous sing-along, organizing gear can be an exercise in creativity, and canoeing can be a chance to explore one another's past.

Even distressing situations are opportunities to grow. Last summer, while leading a canoeing trip on Lake \_\_\_\_, the waters became increasingly choppy. The exhausted teens needed to paddle another mile against the wind to reach our campsite. Then a canoe tipped. Three campers bobbed up and down, frantically holding onto their gear to keep it from floating away. After making sure they were okay, and piling their equipment in my canoe, I began towing them to shore. Then one of the campers in the water had a seizure. We were miles away from a phone in a potentially life-threatening situation, and frustration and anger were useless. I directed the other two campers to hold her head above water, and she came out of it within thirty seconds. That night, my co-leader and I facilitated a discussion in which group members shared their feelings about the emergency. The debriefing session unified the group, supported the epileptic camper, and created a sense of trust within the group that lasted for the rest of the trip.

In college, I have seen the impact a passionate mentor can have on students and have experienced the exhilaration of group work. My first role model in math was Professor \_\_\_\_\_, whose eyes lit up when I inquired about his research. He scrawled equations and words that I had never seen, and rapidly described his doctoral work with heartfelt ardor—and his fervor was infectious. After working for two years on our differential equations project, we discovered new conservation laws for a system describing bacterial growth. Generating these physically useful results has been pivotal for me because it has motivated me to pursue applied research.

During my junior year, I joined two students to form Willamette's first team for the international Mathematics Contest in Modeling. In 96 hours we wrote a research paper arguing that each thumb print in human history is unique. Though the problem is typically solved using computer methods, we combined forensic techniques with a simple probability calculation to produce a solution that won honorable mention. Individually, we would not have come up with this solution: it depended on our combined knowledge and ideas. We presented our findings at Willamette and at Oregon's Academy for Sciences conference, where lively exchanges encouraged my enthusiasm for our project and scientific research.

The following summer I joined twelve students in a research program at the University of Washington. We convened at lunch, dinner, and in the evening to discuss a wide-range of concepts within physics—from string theory to determining why the air from a fan feels cold on your skin. Our discussions created a synergy that does not occur when reading a publication. The German statistical mechanic K.R. Mecke, whose work I studied at the University of Washington, harnessed that sort of energy in his work. He organized conferences, compiled volumes of relevant papers, applied ideas from within statistical mechanics to other areas of physics, and clearly stated open questions. I, too, hope to support and collaborate with researchers outside of my immediate community and to develop avenues of communication beyond publications.

I have lived a privileged life. Those suffering from diseases such as cancer or AIDS may not have the chance to feel that the world is a good place to be. I hope to improve some of these

situations by researching the mathematical and bio-physical questions involved in the study of cancer and spread of viruses. I have chosen this path over pure math because I want my work to affect people directly. My background in differential equations is excellent preparation, since it is the foundation of many mathematical models. My work in physics and at camp has given me the tools to study with biologists, mathematicians, physicists, engineers, and computer scientists in the multidisciplinary environment that computational medicine requires.

If I researched computational medicine in the US, my work would be part of an applied math track, and therefore would have limited support from other disciplines. At the Mathematical Institute at Oxford, dozens of professors from five departments and nearby universities collaborate on research in mathematical physiology, tumor growth, and cancer treatment. The M.Sc. program in Mathematical Modeling would teach me methodological approaches to applied topics, and allow me to hone my skills in a research project. After completing this yearlong program, I would research in a European-wide project, *Using Mathematical Modeling and Computer Simulation to Improve Cancer Therapy*. Seven universities and research institutions including Oxford are combining efforts to develop a comprehensive grasp of tumor dynamics. I will become part of this groundbreaking community and bring back to the United States its enthusiasm for collaborative work.