

## HONORS CHEMISTRY RESEARCH PROJECT

### 迷失在塔克拉玛干

### Lost in the Taklamakan

#### The Scenario

"Let's get out of here, Harry!" you yell as you jump into the seat next to the pilot of Chemily, a two seated dual-engine aircraft. As you twist around in the seat to close the co-pilot hatch, you see the terrorists come rushing out of the hanger's side door. One of them stops and levels his semi-automatic assault weapon at your plane. The noise of his shots is covered by the plane's engine suddenly exploding to life. "Get outa here Harry; they're going to hit the plane!" He pushes the throttle forward and mutters to his plane, "Come on baby. We're gonna need all you got." To your relief, the gap between the Chemily and the airstrip's hangar quickly widens. The terrorists are still taking shots at you, but now you are out of range. Harry pulls the plane to 15,000 feet and levels off. "It's gonna be a long ride to Lhasa," he says, "but if I have to travel the Silk Road, I'd rather do it from up here! Why don't you try to get some sleep? You look like you need to be buried." Exhausted, you settle back in your seat. Since you haven't slept for days, you are really looking forward to a long, uneventful trip home in time for Christmas.

A sudden jolt awakens you from your rest. Harry is wrestling the yoke, trying to keep the plane level. "They shot my baby. We may be slightly off course." he growls through his teeth. He taps one of the gauges with his finger. You lean over to see that the oil pressure is critically low. One of the shots must have hit the oil line. "We've lost the starboard engine." Harry shouts. You know that the oil systems in both engines are interconnected and that the engine on the left will stop soon. As you look outside your window, you can see smoke billowing from the other engine. Below, the rolling dunes of the Taklamakan extend as far as the eye can see. "The other one's out!" Harry yells, "We're losing altitude fast! As close as I can figure, we're about 350 km northeast of Hotan, but it's anybody's guess. I filed a flight plan with headquarters before we left, with any luck they'll send help. Brace yourself we're going down!"

Suddenly you hear the deafening clamor of what sound like tearing metal. Just as you think the noise will never stop, you realize that you have crashed. With blood dripping down your face, you slowly unbuckle your seat belt and try to awaken Harry. Unfortunately, he is dead. Suddenly you smell fuel. Knowing that the plane will blow up at any minute, you quickly examine the cargo and debris scattered about the cabin of the plane. The list that follows describes those items that you are considering taking with you to survive the desolate wasteland of the Taklamakan

#### Project Notes:

## The Items

1. Case of Rhino Aluminum heavy duty aluminum foil
2. Small box with a partially peeling label, "N-Hydroxy-N-(4-hydroxyphenyl)acetamide"
3. Clear plastic bottle with a pale yellow powder labeled "Europium Doped Strontium Aluminate"
4. Five-liter bottle of 80% C<sub>2</sub>H<sub>5</sub>OH
5. Friendly Forest Gnome embroidery kit
6. Fujifilm QuickSnap Flash 400 disposable camera with two exposures remaining
7. Heavy duty neodymium magnet with carabiner snap hook
8. Irish flageolet
9. Wooden crate labeled "Soman-GD"
10. Large black garbage bag fill with old Tibetan newspapers
11. Mesh bag labeled, 两打柠檬
12. One gallon jug of Happy Belly canola oil
13. Pack of 100 anti-static zip top polyethylene bags, pink
14. Two meter length of refrigeration tubing
15. Opened bag of Wickedly Prime honey sesame roasted cashews, 12 ounce
16. Opened pack of Wrigley's EXTRA Spearmint Sugarfree chewing gum, 7 sticks remaining
17. Small clear glass vial with a cork stopper labeled, "C<sub>22</sub>H<sub>28</sub>N<sub>2</sub>O"
18. 4 ounce tube of Boudreaux's Butt Paste diaper rash ointment
19. Spyderco Native 5 Salt
20. Twenty square-meter sheet of chartreuse polyethylene terephthalate
21. Two wrapped blocks in a ragged cardboard box labeled, "RDX"
22. Wooden crate labelled "A-1 Home Repair Company" containing bottles labeled "Muriatic Acid" and "Professor Amos SuperFast Drain Cleaner"
23. Bigfoot Poly Pusher snow shovel with a wooden handle

## The Mission

From your knowledge of chemistry, survival tactics, and research information, choose only 10 items from the above list which will maximize your chances for rescue.

After you have carried your supplies to a safe distance, the plane explodes, and you turn back to see that every single item you left behind, and also every scrap of debris remaining from the explosion, has disintegrated – never to be seen again. Emptying the pockets of your Eddie Bauer flight jacket you find, in addition to the other 10 items you had gathered only seconds earlier, a handkerchief, a passport, two quarters, three pennies, your lucky zinc penny, and a wallet containing a few credit cards, three \$50 bills, an address book, and a picture of your family. And now your attempt at survival begins.

If you do everything correctly – and that includes using your knowledge of chemistry and correctly addressing ALL of the aspects of survival, you can assume that you will be rescued in three days.

A hint on how to start: **first**, prioritize your needs, i.e., food, shelter, water, signal, etc. **Second**, identify each item and determine under which category it would be used. The rest is up to you! And now your attempt at survival begins.

## The Journal

After you are rescued, you will write an illustrated journal account of your survival. (This is the typed research paper that you will turn in on the due date.)

Your journal account must have some type of introduction and a conclusion and must include these three major sections with illustrations. Each section must start on a new page, and be divided into smaller, "mini" paragraphs containing the following:

- 1) The Ten Items I Chose: The ten items you chose and a brief explanation as to why each would be chosen by an expert survivalist/chemist;
- 2) Items I Would Like to Have Taken: Items that would have been good to choose, but you were not able to because you could only take ten, AND your reasons why you would have taken them;
- 3) Items I Did Not Want to Take: Items you absolutely do not want to take with you and your reasons why.
- 4) Illustrations: You must include at least two (2) full paged, hand drawn/traced and labelled illustrations to help explain your survival techniques. Each drawing must have correct documentation on the drawing.

## Your Grade

For every item that you tell about that has the correct reason for taking (or reason for not using) and correct documentation, you will receive 3 points. If you don't have either a correct reason or correct documentation, you will receive no points. You will receive 10 points each for your two illustrations that have correct documentation.

There are 10 items that are the top ten that should be chosen for best survival as an "expert chemist." If you choose any of these 10 as the ten you are taking with you to survive, you will receive 8 points per item instead of 3. All of this means the maximum points you can earn on your project (not including extra credit) is 139/100. The highest grade, however, that you can make on the project is 110/100.

## Research Guidelines

- SOURCES:** You must have at least three different sources that you may use multiple times each. Anything from the Internet will count as one source. This means you will have to have at least two book sources. You can use eBooks as your book sources. Once you have three different sources, you may use any one of them as many times as you need. For example, if you have two different books, you can use the Internet as many times as you like.
- You cannot use Wikipedia, WiseGeek.org, About.com, Yahoo Answers, Google.com, Quora.com or any other such site as a source you reference in your paper. If you do so, you will not be given any credit for the item. You may use any of these as a place to get ideas, but you must have a professional, published source to reference in your paper that backs up the information in these sources.
- You cannot use any video sources as a final source for your paper, but you may use them as a place to get ideas. In order to receive credit, you must have a professional, published source to reference in your paper that backs up the information in any video sources.
- You will have a ton of research to keep up with, so a STRONG suggestion is to use a tool like Google or Evernote to organize your online research and then only print what you need at the end. The printed copies of Internet sources must contain the URL at the top or bottom of the page. You may not copy and paste from the Internet

**IMPORTANT:** Please be advised, your research on these items will take a long time and putting your journal together will also take a great deal of work. Make sure you budget your time so that you have not only ample time for research, but also plenty of time to write your journal account and put it in its proper format, as well as compile your Works Cited.

This is the end of PHASE 1, the research phase of your project. STOP HERE FOR NOW until you have a very good start on your research and are ready to begin assembling everything to start writing your paper.