

Lone Wind Project

You will work in groups to complete one of the following projects:

1. Freedom on the Beach
2. Cell Power
3. Grizzly Find

The Project

While each of the three projects are different, the way in which you tackle them should be fairly consistent. Think of this project as a lab :

- What is your **purpose**?
- What **materials** will you need?
- What **method** will you use to solve your problem?
- What **observations** did you make along the way?
- What are your **conclusions**?

The Oral Presentation

Each oral presentation should last approximately 10 minutes and will be evaluated by your teacher using the presentation rubric. Your presentation can take any form your group wishes but must include answers to the five questions above and some visual aids.

Option A : Freedom on the Beach

There are three lifeguard stations on the beach of the Lone Wind Place Map (labelled A, B and C). The city has been given \$500 000 from a local philanthropist that must be used to improve the appearance of the beach area. The city council, after consulting with a citizen's group and a well-known local artist, has decided to put a Freedom Fountain out in the water. For aesthetic purposes, the Freedom Fountain is to be put equidistant from each of the three lifeguard stations. What are the coordinates of this point? This is of particular interest because the fountain will have special lighting and hence expensive underground cables will be necessary. If there is already cable running from tower A to tower B, how much cable will be necessary to reach the fountain? How much will the cable cost if it is \$500/km?

Option B : Cell Power

There are three communication transmission towers (P, Q, and S) indicated on the Lone Wind Place map. The city's public works department is responsible for deciding the most economical way to provide cell phone power to the entire island. There are only four different types of transmitters available, they are :

- 1 km maximum distance, cost is \$100 000
- 2 km maximum distance, cost is \$175 000
- 5 km maximum distance, cost is \$ 400 000
- 10 km maximum distance, cost is \$750 000

The city planners have proposed the following options :

Option #1 : Use some or all of the three existing towers as transmitters

Option #2 : Build a new tower at the point of intersection of the medians in the triangle formed by the other three towers and then transmit from this tower. The cost to build the new tower is \$350 000.

Which option is more economical? How much will the project cost the community?

Option C : Grizzly Find

The LONE WIND PLACE Conservation Area is determined by points F, J, and H on the Community Map and is completely enclosed with fencing. There have been recent sightings of grizzly bears in the region. Julia, has been given a summer job which includes two responsibilities :

First : Julie must tally the grizzly population in the conservation area by separating it into four congruent (same area) triangular regions. This will allow her to apply sampling principles to estimate the total number of bears by finding the number of bears in any one of the areas. Julia has decided to choose her four congruent triangles by ensuring that three of the regions has two of its boundaries on the fence lines of the conservation area. She must report the following data :

- i) The equations of the lines of the new fencing which is needed to divide the area into the four congruent triangles.
- ii) The amount of fencing required.
- iii) The total cost, given that the fencing costs \$32/km.

Second : Due to concerns about grizzly attacks, officials wish to build a first aid station at the point of intersection of the medians of the triangular conservation area. Julia must determine the location for the first aid station.