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INTD 255
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Midterm 1

1. Early Antarctic and Oceanographic Exploration

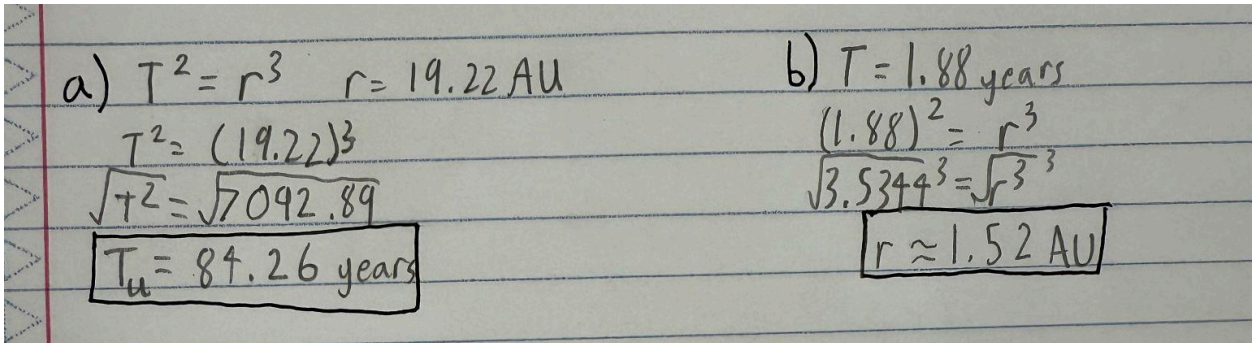
1. Who was Captain James Cook? List several notable achievements of his three main expeditions.

Captain James Cook was a famous British explorer who had a number of accomplishments. A few notable achievements are his mapping of New Zealand, crossing the Arctic circle, and exploring the Hawaiian islands where he was later killed.

2. What was the significance of the venus transit on one of the Cook expeditions? What other, more secret, mission did Capt. Cook have in the Southern Ocean?

The main reason that Cook was sent on his expedition was to observe the transit of Venus from Tahiti which would allow scientists to have a better idea how far the Earth was from the Sun. However, his second, real mission was to explore the Southern hemisphere and to see if the land there could be claimed for Britain.

3. Kepler's Laws: If the units of orbital radius r are AU, and the units of orbital period T are years, then T^2 = r^3 . (a) If the orbital radius of Uranus is 19.22 AU, what is its orbital period in years? (b) If the orbital period of Mars is 1.88 years, what is its orbital radius? (c) What parameter in orbital mechanics was fixed by the observations of the venus transit in the late 18th Century by scientists who accompanied the Cook expedition?



c) The scientist who joined Cook's expedition and witnessed the Venus transit were able to improve their calculation of an astronomical unit and found it to be about 153 million kilometers (which is very similar to the modern calculation of 149 million km).

4. List some of the achievements in early polar exploration attained on the following expeditions:

The Belgica

- Roald Amundsen learned important polar survival techniques including how to prevent scurvy.
- The first to spend a winter in Antarctica and persevere through long polar nights.

The Fram, with Nansen

- They became the first to intentionally utilize the drift pattern of the ice.
- They made it the farthest north and closest to the North Pole than anyone had ever been at the time.
- Used efficient methods like dog sleds and fur clothing.

The Gjoa

- Amundsen was the first to have a successful navigation of the Northwest Passage
- Scientific research was conducted on Earth's magnetism which allowed them to determine where the north magnetic pole is.

The Discovery, with Scott

- Scott reached the farthest South at the time.
- He lead the first polar British expedition to the Antarctic

5. Who were the Dorset and the Thule? How did they survive in their environment?

The Dorset and Thule were indigenous natives to the Antarctic land. The Dorset culture came first but disappeared around the 1500s and was replaced by the Thule. In order to survive, the Dorset would hunt seals through holes in the ice and they would use them as a resource for food and clothing. They were also able to craft sophisticated stone tools. The Thule were more mobile and used dog sleds and kayaks to travel. They also hunted marine animals with stone tools and lived in Igloos.

6. Who are the Chinook? Where did Capt. Cook approach their territory?

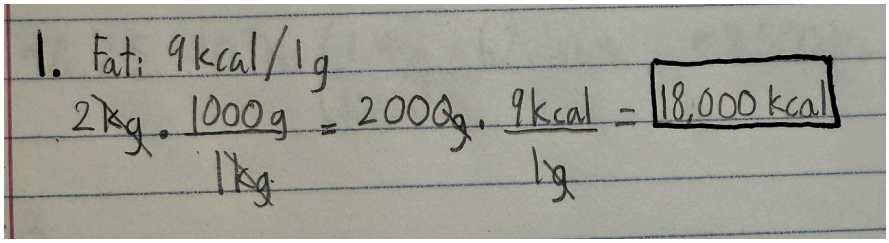
The Chinook were indigenous people who lived near the Columbia river. Captain Cook encountered the Chinook territory while looking for the Northwest Passage. The Chinook were highly skilled at hunting, fishing, and trade.

7. Discuss the risks and rewards of cultural exchange, in light of the writings of Barry Lopez in Horizon. As examples, consider the stories of Ranald MacDonald, Captain James Cook, Captain Amundsen and the Netsilik .

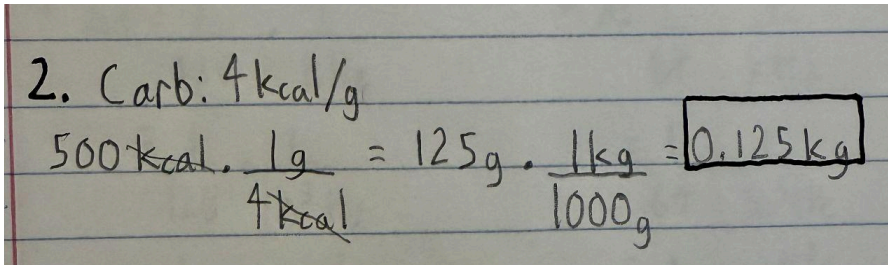
When different cultures interact with one another it can lead to a transaction of knowledge and can deepen our world's understanding of how humans operate, however, it can sometimes have consequences. For example, when European explorers like Amundsen's team came into contact with the inuit Netsilik people, the knowledge that they acquired from them on polar survival was crucial and extremely helpful. The idea to travel using sled dogs and wearing fur clothing proved to be far more efficient than the methods that came from other European explorers. However, with the Euorpeans came western diseases and colonization that disrupted the culture of the Netsilik and harmed their community. It can be said that, unfortunately, sometimes when two cultures merge together, one overpowers the other and winds up just absorbing the other culture into themselves.

2. Survival Skills: Work, Energy, Food, and Physics

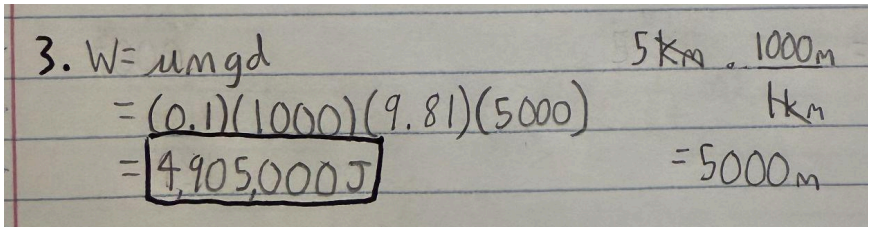
1. How many kcal of energy is stored in 2 kg of pemmican? (Treat this as a fatty food, not a protein).



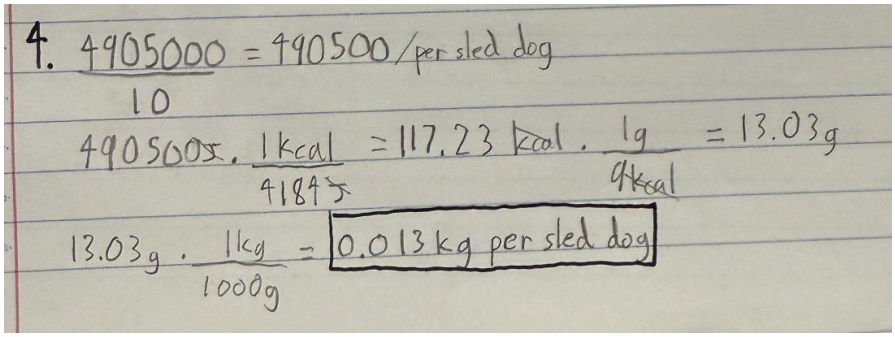
2. How many kg of wheat biscuits are required for 500 kcal of energy? (Treat this as mostly carbohydrates).



3. How many Joules of energy are required to pull 1000 kg across 5 km of snowy tundra, if the relevant coefficient of friction is 0.1?



4. Take your result from the previous exercise, and divide the energy among 10 sled dogs. How much energy is required of each dog? Now feed each dog that much pemmican. How many kg of food, per dog, is required?

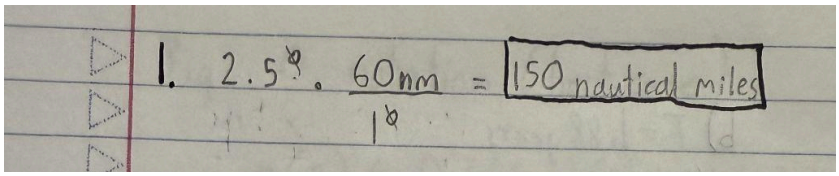


5. What food related health risk is associated with spending long durations at sea and in polar regions?

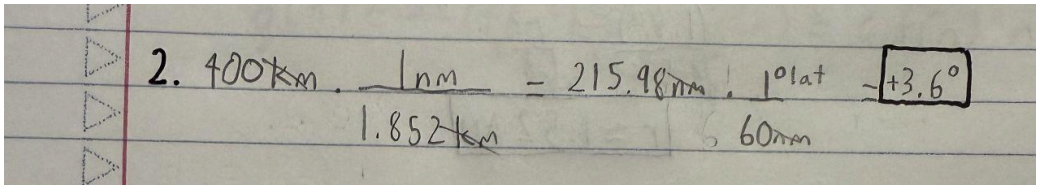
When you take long polar or sea expeditions where food and sunlight is scarce, you run the risk of getting scurvy. Scurvy is caused by a lack of vitamin C and it can lead to a deficiency of collagen, which is what repairs your skin. Sailors/explorers who have it begin to have difficulty healing wounds, loose teeth, and can even bleed internally.

3 Navigation: Distance, Time, Speed, Longitude and Latitude

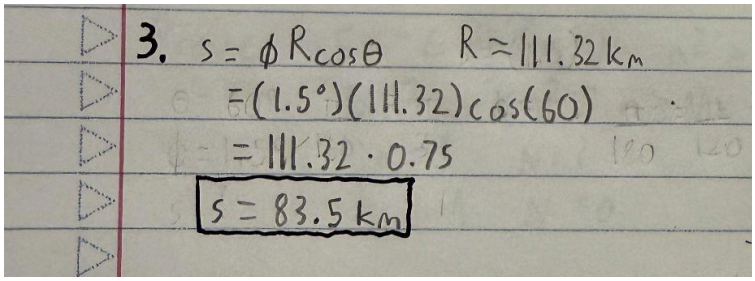
1. How many nautical miles correspond to travelling 2.5 degrees directly South?



2. If we travel due North by 400 km, what is our change in latitude?



3. If we are travelling due West at a latitude of 60 deg North, what distance corresponds to a change of 1.5 degrees longitude?



4. If a ship sails East at 10 knots, how many nautical miles are travelled in 48 hours?
Pic 4

4. The British, The Norwegians, and Cultural Exchanges

1. Having read the first part of the story of the race for the South Pole, describe the differences in style between the Norwegian/Scandanavian expeditions and the British ones. Bonus: Connect your ideas to indigenous cultural exchange, or our reading in Deep Survival.

There is a large contrast between the Norwegian/Scandanavian expeditions led by Amundsen and the British ones led by Scott. In Deep Survival, Gonzalez really emphasizes that a crucial part of survival is your ability to adapt to cultures around you and become mentally flexible. This can be directly applied to the differences in the mindsets of Amundsen and Scott. Their different styles come from the different objectives that they each felt were most important. Amundsun took a very practical approach to his voyages and did his cultural research to find the best way to survive in a polar climate. He was heavily influenced by arctic culture and adopted the techniques of the Unuit peoples by using sled dogs and wearing fur clothing. His main objective was to get there and get back as simply as possible. Scott, on the other hand, was much more concerned with the science and research that could be conducted in the polar environment than the culture that it holds. His use of horses showed his eurocentric and

narrow point of view, and that he was less willing to adopt the approach of the Arctic natives, which ultimately led to his downfall.

2. List five technologies for polar survival that the Norwegians learned from the Netsilik.

- Building Igloos to live in because of the insulating properties of the packed ice.
- Using fur clothing that minimized moisture and kept in body heat.
- Dog sledding which was the most reliable and effective polar transportation.
- The use of skiis that were longer and flatter and allowed for quicker travel.
- Having a diet full of fresh fatty foods and protein like pemmican and seals to avoid scurvy.

3. What was the primary role of the Royal Geographic Society in British Antarctic exploration?

The Royal Geographic Society secured the financial support and sponsorship for British Antarctic expeditions. They prioritized national honor and scientific discovery. They had strict and traditional methods and had a large influence on polar expeditions.

4. (a) How did the British travel and move gear in the polar regions, before motorized craft were developed? (b) How did this differ from the Norwegians?

a) Before the motorized craft, The British moved their gear using either man-power or ponies, which was ineffective because the horses were not accustomed to the harsh climate.
b) The Norwegians' use of dog sleds proved to work much better than the British because the dogs were used to the polar climate and could be sustained by feeding them seal meat.

5. In your view, what are the major risks to ships and explorers when exploring the polar regions in this period?

The greatest risks of exploring polar regions stem from the lack of the essential resources the human body relies on to function. Exploring Antarctica is like traveling to another planet. The lack of sunlight, extreme cold, and scarcity of food put immense physical stress on the human body, which makes survival a constant challenge. It also takes a lot of mental strength. The long polar nights are like nothing we are accustomed to back at home, and if you don’t have the willpower to make it through to the end, It could affect your ability to make it out.

6. When American ambassadors first arrived in Japan, after a period of intense isolationism in Japan, they found the Imperial court already knew how to speak English? How did this happen? Who helped them to learn English, and of the desire of Western nations to trade?

For a long time, Japan had extremely strict borders and did not allow any foreigners to stay for long and saw them as a threat to Japanese authority. However, an American sailor named Ronald MacDonald (who was mixed with Scottish and Chinook) shipwrecked in Japan and was taken in to be interrogated. However, instead of being executed, Macdonald was allowed to stay and to teach English to the Japanese people, which would give them an advantage in any future political negotiations. He became the first native speaker of English to teach people in Japan, and he was the reason that the Imperial court knew how to speak English when no one expected them to.

7. Consider the following quote "Whether the change facing a people comes on swiftly ... or slowly ... the responsibility of the wisdom keeper is to recognize the early signs of significant change, to look into the past, and locate, again, a through line to the future." Apply this idea to a story we have encountered in the course, or a problem facing our community today.

This quote applies to the ongoing struggle for personal freedoms and rights in America, particularly for women. The overturning of Roe v. Wade represents a step backward, restricting access to reproductive rights that had been legally protected for decades. This moment calls for wisdom keepers like activists, and political advocates to recognize the signs and look back to how a lack of reproductive autonomy has harmed us in the past. Then to learn from past battles for civil rights, and then make a path toward restoring these freedoms for future generations.

5. Exploration Achievements

1. Discuss the cultural significance of Nansen's first crossing of Greenland to the nation of Norway.

Nansen's accomplishment of crossing Greenland established the nation of Norway as a leading force in polar exploration and essentially made Nansen a hero in the eyes of his nation.

2. Was Roald Amundsen the first leader to cross the North-West Passage? On whose progress did he build?

Roald Amundsen was indeed the first to cross the Northwest passage. He built his progress on several previous explorers. One of whom being Sir John Franklin whose ships traveled parts of the Northwest passage before they became trapped in the ice. Another was Robert McClure who was able to partially navigate some of the passage.

3. What were the highlights of Robert Falcon Scott's "furthest South" on the Discovery expedition?

The main highlight of this expedition was setting the record of reaching 82°17′S. Another was the scientific research and data collected on the wildlife in Antarctica, specifically the Emperor penguin.

4. Scientifically, why was it important for explorers in the early 20th century to locate the magnetic North and South poles?

It was important to locate the magnetic North and South poles because they needed to understand that they were moving over time. In the early 20th century, compasses were a key part of navigation, so you had to understand the difference between magnetic north and true north to know where the relative position of your destination was. Especially because adventuring near the poles could skew the accuracy of your compass.

6. Survival and Psychology

1. Using the terminology found in Deep Survival, what is the difference between a primary emotion, and a secondary emotion?

A primary emotion is something that is instinctively in your nature and that you are born with, such as hunger, pain, and joy. A secondary emotion, however, is something that develops over time from personal experiences such as embarrassment, anxiety, and pride.

2. Using the terminology of emotional bookmarks, how are secondary emotions formed, and how do they protect you?

When you experience a situation that evokes a deep emotion in you, your brain creates an "emotional bookmark" of the experience and holds it in your subconscious memory.

Then when you are put in a similar situation, your body will start to evoke that emotion almost like a warning. These secondary emotions can protect us because they help us to make educated decisions and let us know when we are in danger so that we have a better chance at survival,

7. Reflections

1. While on Skraeling Island, the write Barry Lopez interacts with a research team responsible for finding artifacts from Dorset, Thule, and Norse cultures in Northern Canada. What is the significance of these diverse finds, in your view?

The diverse range of artifacts discovered in Northern Canada is very significant because it shows the complex history of human presence and cultural interaction in the region. These different artifacts demonstrate that Dorset, Thule, and Norse peoples each adapted uniquely to the harsh Arctic environment. The artifacts show how these cultures developed survival strategies to cope with extreme conditions, such as with different hunting techniques and tools. The presence of all these diverse cultures in close proximity suggests the possibility of cultural exchange and interaction between them. Studying these artifacts deepens our understanding of the past and also expands our knowledge of the cultural mix of societies across time.

2. While reflecting on the Pacific Ocean in Cape Foulweather, Lopez notices that you can never see the entire Pacific, because the Southern Ocean covers more than one hemisphere of area of our planet. What an area of life or academic topic that you wish you understood, but might not ever fully understand?

One area of life that I have always found interesting, but may never fully understand, is the complexity of the human brain, specifically the way that it chooses to protect itself. There is so much surrounding it that we have yet to discover. How memory works, for example. Why is it that a core memory made in childhood can be completely forgotten, yet it still impacts your behavior in your adult years? This connects to that same “emotional bookmark” theory. I also find it interesting how the brain attempts to defend itself from what it deems as harmful. For example, in rare cases, people who experience extreme trauma sometimes develop dissociative identity disorder, where the brain literally splits itself into multiple “people” with unique identities that surface when faced with triggering situations. There is so much power held within the brain that neuroscientists have still yet to fully grasp, and I hope to learn and understand more about it in my lifetime.