

91429



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Level 3 Geography, 2018

91429 Demonstrate understanding of a given environment(s) through selection and application of geographic concepts and skills

9.30 a.m. Friday 23 November 2018
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of a given environment(s) through selection and application of geographic concepts and skills.	Demonstrate in-depth understanding of a given environment(s) through selection and application of geographic concepts and skills.	Demonstrate comprehensive understanding of a given environment(s) through selection and application of geographic concepts and skills.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

Pull out Resource Booklet 91429R from the centre of this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–11 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Excellence

TOTAL

20

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INSTRUCTIONS

Read the resource booklet and the questions in this booklet before you begin your written answers.

Select and apply a range of geographic skills to comprehensively analyse the various geographic concepts as they apply to Greenland.

QUESTION ONE: GREENLAND'S ENVIRONMENT

Refer to **Resources A–E** on pages 3–7 of the resource booklet when answering this question.

(a) Describe in detail Greenland's natural environment.

Select and apply a range of geographic skills to support your answer.

Greenland is the world's largest island with a land area of 2166086 ~~km~~ square kilometers. (Source A) Greenland's nearest land form is the Canadian Ellesmere island located just 26 km away and the nearest European country is Iceland. ~~which~~ Iceland is 320 km south east ~~of~~ across the Denmark Strait. (Resource A). Greenland is considered an Arctic climate with large areas of the island classified as Arctic deserts due to the lack of rainfall/precipitation. (Resource B). Two thirds of the island are within the Arctic Circle, this means that a major physical feature of Greenland is their 'ice sheet' which has an average thickness of 1500 meters and covers over four fifths of the total land area. (Resource A). As a result of the location and climate Greenland also has continuous and discontinuous permafrost. Permafrost is when moisture in underlying ground and soil is frozen. (Resource C)

- (b) Comprehensively explain how the natural environment influences the cultural environment of Greenland.

Due to harsh and extreme conditions of Greenland's environment the cultural environment has been significantly impacted. Harsh onland environment such as a thick ice sheet and permafrost (Resource A & B) have meant that Greenland's economy is based on off shore ventures for the majority. Unlike other European countries much of the land is Arctic desert which doesn't benefit from agriculture. In Greenland agriculture ~~and equates for~~ is only possible on about 1% of Greenland's total land area (Resource E) and therefore they rely on fishing. Fishing equates for a large part of Greenland's culture as the land is inhabited by ~~Inuits~~ people of Inuit or Eskimo descent. (Resource E). These people are adapted to live in colder climates such as Greenland and are long-established fishers and hunters meaning they can rely on fishing as a source of income rather than most land based work. As a result fishing now equates for 90% of Greenland's exports so there is a strong reliance on fish. Lastly due to rare natural environment and harshness of the land Greenland has developed a tourist economy by showcasing the rare features of their environment. (Resource E). Tourists come to see whales, icebergs and fjords which has provided many jobs for the Greenland people.

QUESTION TWO: POTENTIAL FOR MINING

Refer to **Resource F** on page 7 of the resource booklet when answering this question.

(a) Identify the top THREE industries/areas of employment in 2015 as shown in Figure 10.

- (1) ~~Public administration & service~~ (10307) ✓
- (2) ~~Wholesale & Business activities~~ (4222) ✓
- (3) ~~Fishing, hunting & Agriculture~~ (4085) ✓

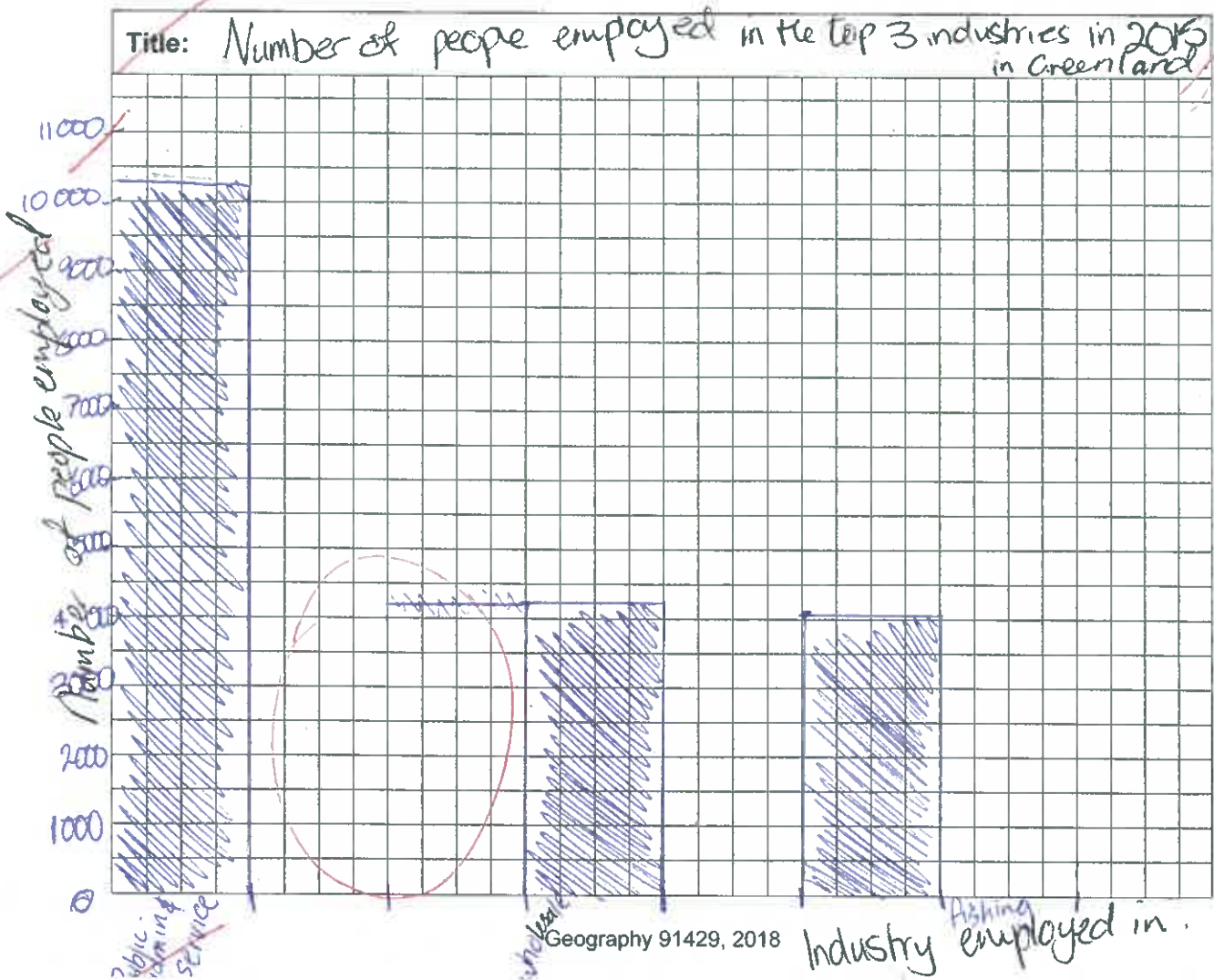
(b) Calculate the percentage of people who were employed in mining and quarrying in 2015. You may use the space below for any calculation required.

Percentage: 0.5%

$$\begin{aligned} \text{mining \& quarrying} &= \frac{124}{25620} \\ &= 4.8399 \times 10^{-3} \end{aligned} \quad \begin{aligned} (4.8399 \times 10^{-3}) \times 100 &= 0.48399 \\ &= 0.5\% \end{aligned}$$

(c) Construct the most appropriate graph to show how many people were employed in the top three industries in 2015.

Use correct graphing conventions in your answer.



- (d) Referring to your responses to parts (a), (b) and (c), and using **Resources G–K** on pages 8–11 of the resource booklet, comprehensively analyse two different perspectives on the potential for mining in Greenland.

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Perspectives may include, but are not limited to: economic, environmental, social, indigenous, and political.

One perspective on mining in Greenland is the political perspective pushed by the government. Greenland's first female prime minister Aleqa Hammond pushed a bill to overturn a 25-year-old ban on uranium & other radioactive substance to be mined (Resource I). Her perspective is to give Greenland a better economy saying "This time we have other options than just hunting." ~~which~~ and that "She simply refuses to be the victimized people of climate change." (Resource I). This shows that while they acknowledge climate change there is a large economic value in mining. Due to Greenland's location they have many deposits of gold, iron ore, rubies, oil, ~~and~~ gas and uranium. Developing a mining industry for these deposits would not only bring full independence ~~to~~ from Denmark but it would result in the 3rd largest uranium mine in the world which would bring many jobs to a population with increasing rates of unemployment. In contrast to this perspective there is a strong environmental stance against mining in Greenland due to its already delicate climate. Non-org government organisations have urged the government to examine the impacts of managing radioactive materials and by-products as these toxic substances could poison waterways and contaminate local water supplies. (Resource I) ~~ff~~

see extra paper

E7

QUESTION THREE: THE FUTURE FOR GREENLAND

Refer to **Resources A–K** on pages 3–11 of the resource booklet when answering this question.

If the Greenland ice sheet continues to melt at the current rate, there could be significant consequences for Greenland's people, economy, and environment.

Discuss the following statement and make a justified recommendation about the best option for Greenland's future:

Greenland must embrace the opportunities for uranium mining.

Refer to at least one of the geographic concepts on page 2 of the resource booklet and specific information from the other resources to support your answer.

Uranium mining is a delicate process which requires serious consideration of the benefits and consequences. While there are serious economic benefits there are serious environmental risks to be considered. The Greenland Ice sheet which provides spectacular fjords and glaciers with a booming tourist attraction is at serious risk already with the rate of ice lost each year due to global warming increasing rapidly with an estimated 1 trillion tonnes of ice lost between 2011 and 2014 alone ^(Resource D) ~~this~~ is a serious issue which would only be made worse by mining. Although mining may bring economic value there is the risk of toxic by products poisoning water ways, ruining fisheries and making the small portion of farmland unusable should something go wrong or emissions not be contained. Locals are worried about similar effects such as the ones seen in Norway after the fallout of Chernobyl which saw land left unusable due to its toxicity. ^(Resource E) Dangers of mining would have environmental impacts on Greenland's ~~pre~~ pre-existing largest sources of employment and economic exports such as fishing which equates for 90% of exports and provides 4085 jobs. So ultimately there is a large question of ~~economic~~ environmental sustainability should mining go ahead as it would lead to a potential change in environment and

economy. On the opposite side the government removed the 25 year ban due to economic benefits to the country. Currently Greenland relies heavily on support financially from the Danish government. ~~which~~ In 2017 the estimated subsidy from the Danish government was US\$535 ~~million~~ million dollars or US\$10000 per person (Resource E). This is a huge reliance on Denmark and it gives employment to 10000 workers. (Resource E). This leaves Greenland in a large debt to Denmark and can potentially restrict further economic ventures due to their alliance so the development of the resources gained by uranium mining could be of large economic benefit and could allow Greenland to become fully independent of Denmark. (Resource I). Allowing uranium mining to go ahead ~~would~~ result in Kvanefjeld being the third largest uranium mine in the world and could provide 8% of the world's uranium production. (Resource I) ~~would~~ would be extremely beneficial in world trading for Greenland. Following on from this ~~would~~ the mines would bring an increase in jobs for communities which have high rates of unemployment. Kvanefjeld ~~mine~~ would be the location for an open pit mine and would provide jobs to the neighbouring town of Narsaq (Resource I) which has a decreasing population due to increasing rates of unemployment after the largest employer, a shrimp processing plant, shut down losing the town over 80 jobs. (Resource I). Greenland Minerals and Energy is an Australian owned company which has invested in the Kvanefjeld mine and says that products of the mine such as rare minerals found in this area

E7

Extra space if required.

Write the question number(s) if applicable.

QUESTION
NUMBER

Q4d) not only would this affect people but it would kill fish and other animals living in the water ways. There are also concerns of endangering fisheries and farmlands which are vital for local communities. (Resource J.) This environmental concern is raised especially by local people of Narsaq where the mines would be. There is one of the few areas in Greenland where sheep farming is able to be profitable and locals are worried about concerns of radioactive dust killing their sheep and making them sick. (Res J)

This is also an economic concern as mining may impact fishing, hunting, and tourism or public service which are two of the largest industries in Greenland, as seen in a, b) and c). This perspective clearly contrasts the economic viewpoint taken from the prime minister as there are serious concerns for the long term environmental viability of mining and Greenland's natural environment due to the radioactive nature of the substances. ~~As~~ The long term use of fossil fuels and their extraction will only further contribute to rising Arctic temperatures which are causing the ice sheet to melt, along with glaciers. (Resource C) Therefore despite many economic gains there is also a serious risk of long-term irreversible environmental damage with negative economic affects.

Extra space if required.

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Q3)

~~are~~ are those commonly used in wind turbines and hybrid cars with uranium only making up 10% of deposits in that location (Resource 1). This means that there would be ~~reduced~~ reduced affects of toxins in this area due to uranium only being 10% of deposits and the mine would supply 2000 jobs during construction with a further 800 jobs (300 guaranteed for locals) after the mine's completed construction. This is extremely beneficial to Greenland's economic independence.

Overall I believe that there must be extremely careful consideration regarding the sustainability of uranium mining and the affects on the environment. Despite economic benefit the affect on Greenland's people would be enormous. The government must examine if mining is a long term solution which can be sustained by the already fragile climate as seen by the Arctic warming and Ice sheet melting. A careless approach such as ~~the~~ "I simply refuse to be richimized people of climate change" from the prime minister is a juvenile approach which may lead to the detriment of Greenland. I would recommend against endorsing uranium mining in Greenland as yes it has economic benefit in the immediate sense but what will be left once everything has been mined, uranium removed, mines closed down? People will return to being unemployed and they may not have any fall back options. The example

Extra space if required.
Write the question number(s) if applicable.

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Q3
cont.

has been left time and time again of a mine coming to close, the town being deserted and like Chernobyl the ground may be too toxic to farm. Radioactive substances are not to be considered a solution without careful consideration.

I would recommend against the embrace of uranium mining because it is relying on a finite amount of mineral/uranium to last the country an infinite time span. This is not a sustainable way of thinking for the long term future of Greenland's economy or environment and therefore I recommend not embracing uranium mining.

Excellence Exemplar 2018

Subject	Geography		Standard	91429	Total score	20
Q	Grade score	Annotation				
1	M6	Part A lacks examples demonstrating using the non-textual information to show application of skills to gain E7.				
2	E7	Geographic skills have been completed appropriately and the candidate understands perspectives. To gain E8 they could have added more detail to their analysis of the political perspective.				
3	E7	This answer is detailed and weighs up the pros and cons of uranium mining and considers the short- and long-term implications as part of their justified recommendation. To gain E8 more should have been included about the other options available to Greenland if the ice sheet continues to melt, such as more land available for agriculture or to extend their tourism industry instead.				