

HOMEWORK: HOW HAS FLORA AND FAUNA ADAPTED TO SURVIVE IN POLAR REGIONS?

Your homework is to research how flora and fauna has adapted to survive in polar regions. You can hand draw or use the computer to produce your work (remember you must print it before the lesson).

- **Grade 1-4:** one example of how flora **and** fauna has adapted. Basic description of how the adaptations help species to survive the climate of polar regions.
- **Grade 5-7:** two examples of how flora **and** fauna has adapted. Simple explanation of how the adaptations help species to survive the climate of polar regions.
- **Grade 8+:** two+ examples of how flora **and** fauna has adapted. Detailed explanation of how the adaptations help species to survive the climate of polar regions.

REMINDER

USEFUL LINKS

http://www.bbc.co.uk/schools/gcsebitesize/geography/ecosystems/tundra_rev2.shtml

http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/environment/3_adapt_to_fit1.shtml

http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel_pre_2011/environment/evolutionrev1.shtml



LO: WHAT IS THE INTERDEPENDENCE OF CLIMATE, SOIL, WATER, PLANTS, ANIMALS AND HUMAN ACTIVITY IN THE POLAR REGIONS?

SUCCESS CRITERIA: I CAN...

- IDENTIFY... (1-2)
- DESCRIBE... (3-4)
- EXPLAIN... (5+)

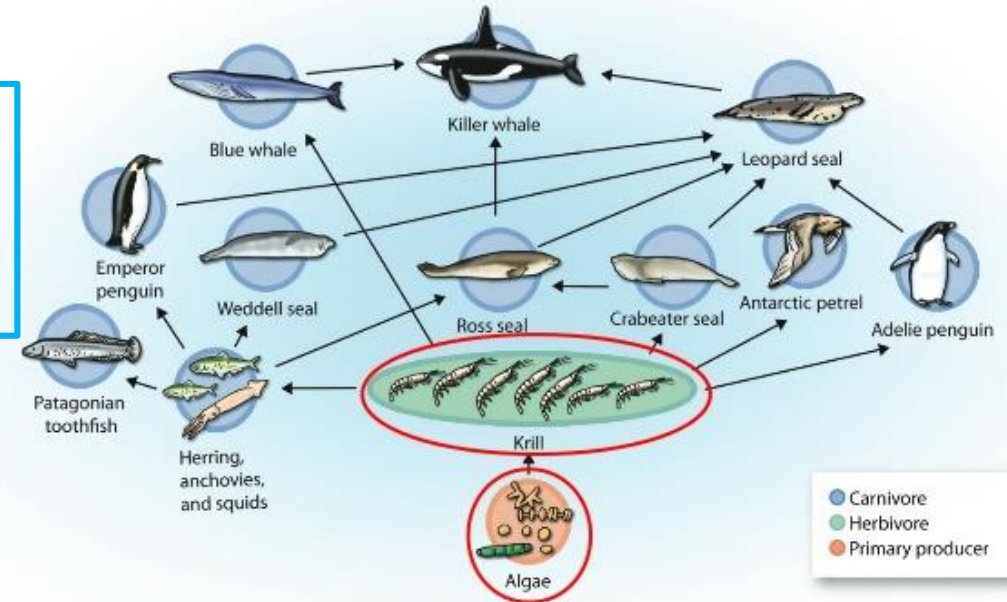
... THE INTERDEPENDENCE OF CLIMATE, SOIL, WATER, PLANTS, ANIMALS AND HUMAN ACTIVITY IN THE POLAR REGIONS.

Each part of an ecosystem relies on every other part for its survival...this is called **interdependence**.

Watch the following mini clip from Frozen Planet 'Bottom of the food chain'. [JOE]

It is about krill in the **Southern Ocean**, however this species is also of vital importance in the Arctic too.

Antarctic Food Webs



What do krill look like?

What do krill eat?

When does algae thrive? Why?

What depends on krill?

WHAT WOULD HAPPEN IF ALL THE KRILL DISAPPEARED?

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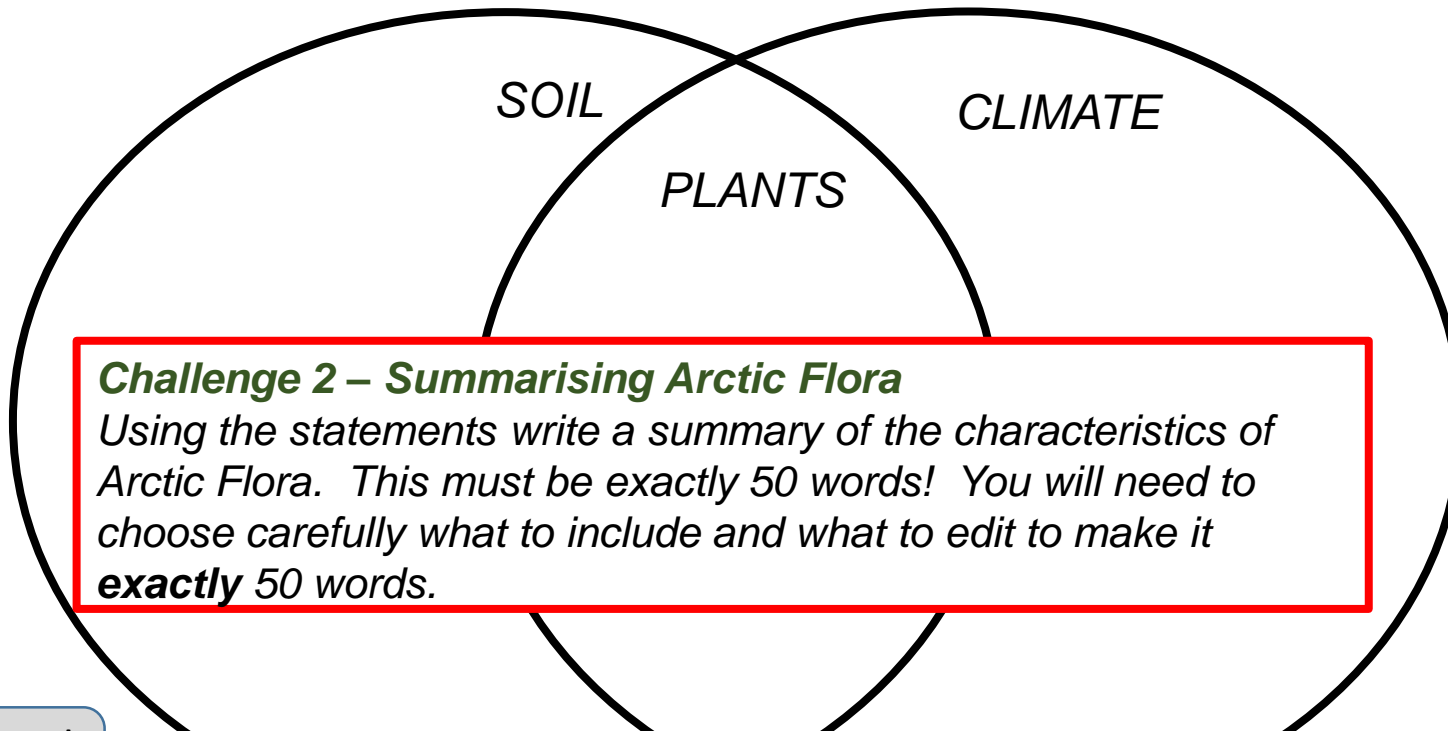
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Challenge 1 – How are climate, soil and plants interdependent in the Arctic?

- Sort the statements into the Venn diagram under the correct headings of 'soil' and 'climate'.
- Put statements related to plants in the overlapping section of the diagram

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Challenge 2 – Summarising Arctic Flora

Using the statements write a summary of the characteristics of Arctic Flora. This must be exactly 50 words! You will need to choose carefully what to include and what to edit to make it **exactly** 50 words.

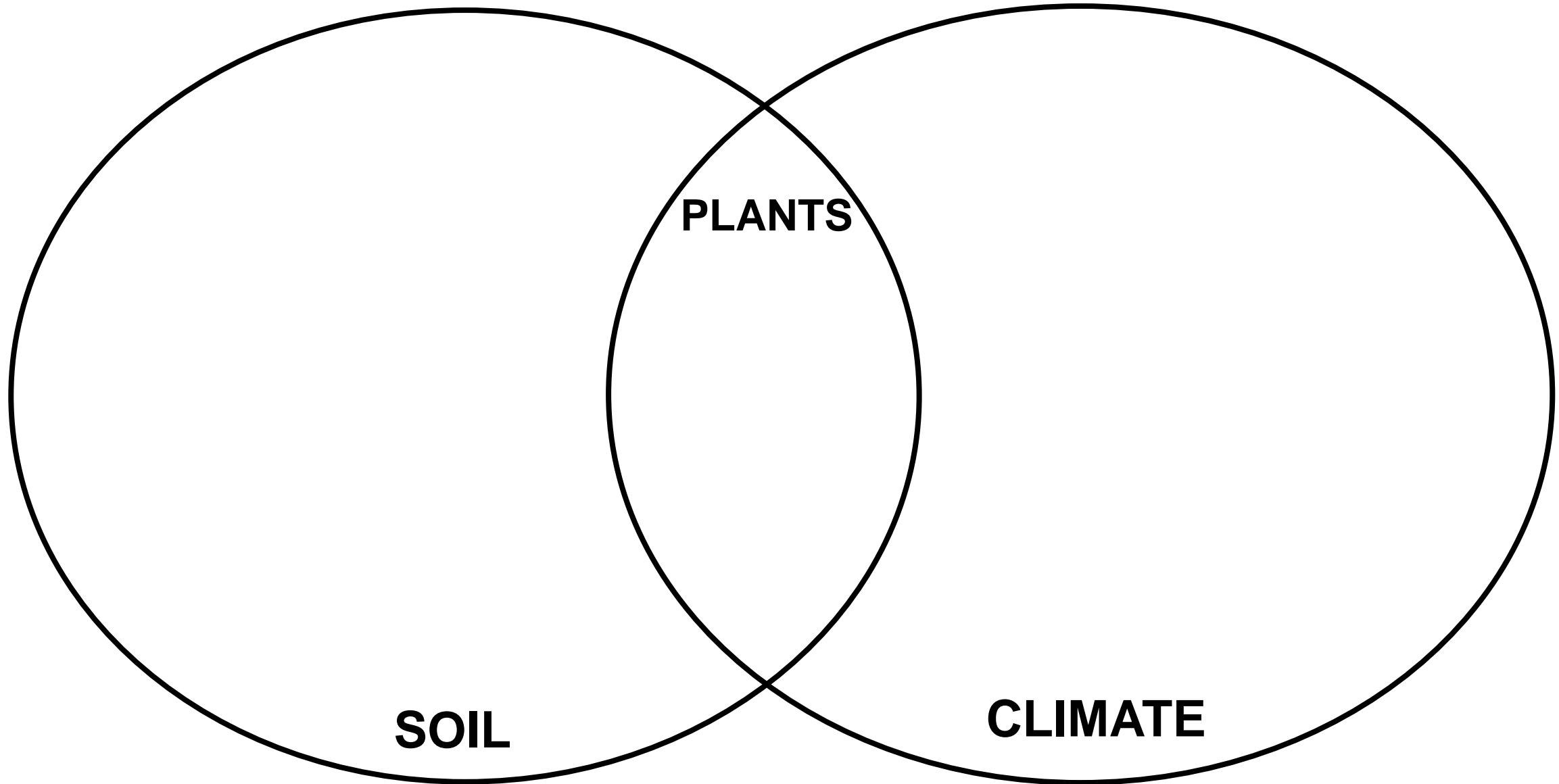
| | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| a) The Tundra biome has fewer plant species than any other biome. | f) Tundra plants have short roots. |
| b) There is only a thin humus layer as only a small amount of leaf litter is produced. | g) Plants in the Arctic grow very slowly. |
| c) The ground is permanently frozen below 50cm. This is called permafrost. | h) Tundra plants have small leaves to reduce transpiration. |
| d) Plants are low and compact, reaching a maximum of 30cm high. | i) The average annual temperature range is -28°C (winter) to 3°C (summer). |
| e) Where the ground isn't frozen, the soil is often waterlogged from snow meltwaters or melting permafrost | j) The Arctic receives very little precipitation and is considered a desert. It is also very windy. |

come get it!



Suggest another reason why the soil so thin?
What's the geo-lingo for the thawing layer of soil?

LO: How are climate, soil and plants interdependent in the Arctic?



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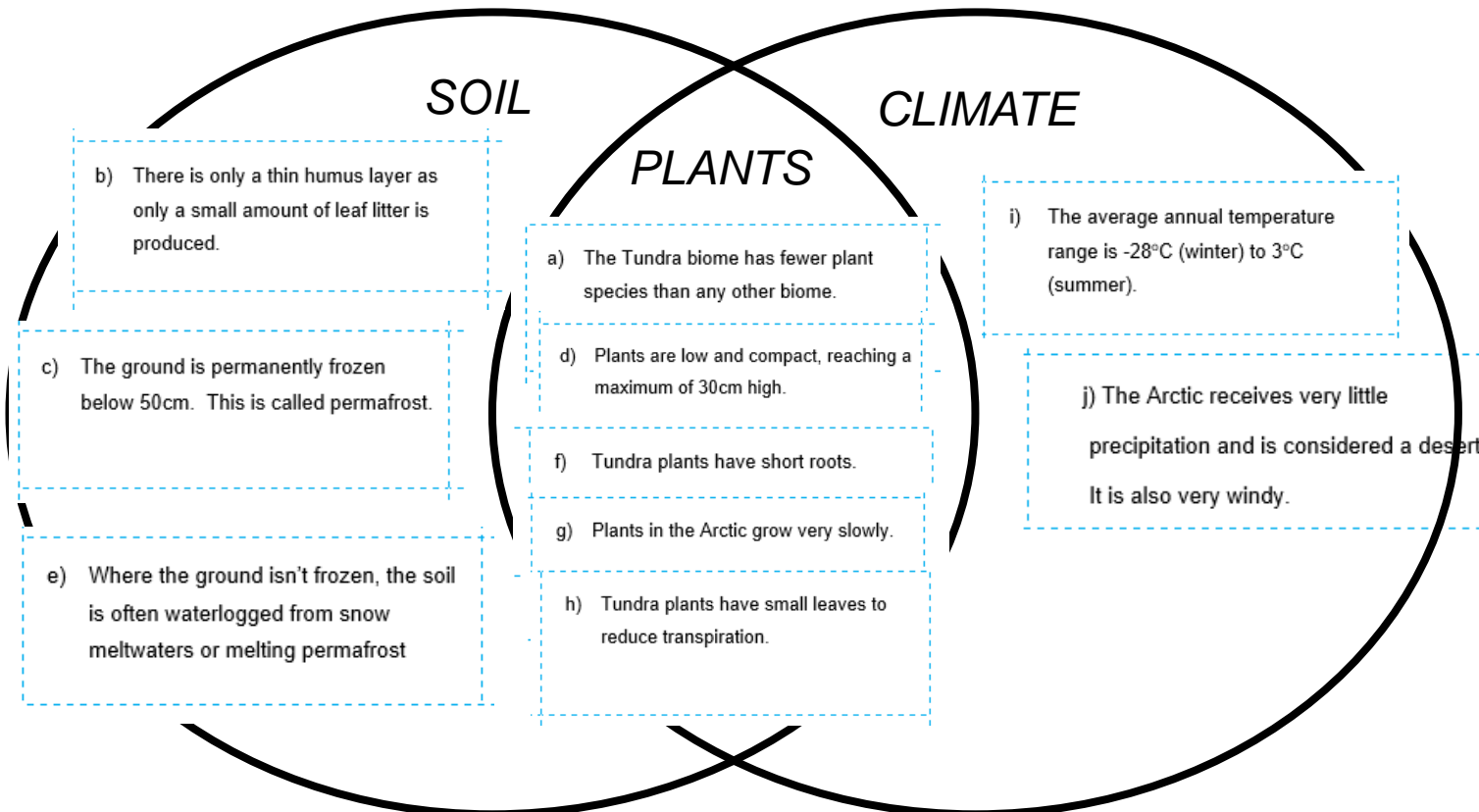
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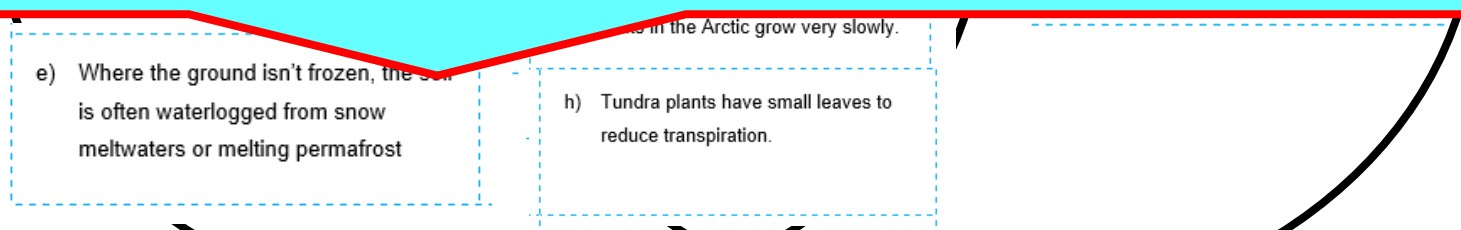
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THINKING LIKE A GEOGRAPHER:
HOW ARE PLANTS INTERDEPENDENT ON THE CLIMATE IN THE ARCTIC?
WHAT WOULD HAPPEN TO THE PLANTS IF THE CLIMATE CHANGED?

Summarising Arctic

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Challenge 3 – Who lives in the tundra biome?







- Look at the table of **Tundra-dwellers**. How could they be grouped?
- To get started you could think about flora (plant) and fauna (animals). Colour code as appropriate.
- Can you make any **links** between the tundra dwellers in your table? Cut out the table and re-arrange to create **a food web**.
- You could also categorise them as producers, secondary consumer, primary consumer and tertiary consumers. Colour code as appropriate.

BOOSTER: add some extra species to your food web

Using the food web, explain...

- how the polar bears in the Arctic tundra are reliant on the krill
- how the lemmings in the Arctic tundra are dependent on the soil

Tundra-dwellers

| | | | | |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <p>Polar bear</p>  | <p>Harp seal</p>  | <p>Whitefish</p>  | <p>Snowy owl</p>  | <p>Krill</p>  |
| <p>Arctic cod</p>  | <p>Reindeer</p>  | <p>Snowshoe hare</p>  | <p>Arctic willow</p>  | <p>Ice algae</p>  |
| <p>Arctic moss</p>  | <p>Ivory gull</p>  | <p>Walrus</p>  | <p>Lemming</p>  | <p>Kelp</p>  |

Tundra: a vast, flat, treeless Arctic region of Europe, Asia, and North America in which the soil is permanently frozen.

Trophic cascade: the transfer of energy through an ecosystem as a result of food chains; at each level energy is lost.

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Challenge 4 – How do humans impact the tundra ecosystem?

The table opposite shows **some additional Tundra-dwellers**. How might these groups affect the ecosystem (food web) that you created in Challenge 3.

Add these indigenous people to your food web and give detail on the possible effects.

| Sami | Inuit | Koryak |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The Sami are indigenous people of northern Europe (northern Norway, Sweden, Finland and part of Russia). Their traditional livelihoods include coastal fishing and nomadic reindeer herding.</p>  | <p>The Inuit are indigenous people of Arctic Greenland, Canada and the USA. Their traditional way of life includes hunting and fishing.</p>  | <p>The Koryak are indigenous people of north eastern Russia. Their traditional way of life is coastal fishing and nomadic reindeer herding.</p>  |

come get it!



Tents and igloos have been replaced by permanent buildings – why are these raised off the ground?



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WHAT WOULD BE WORSE?



NO KRILL..



OR NO ICE?