

Bilingual Geography Year 9

The four seasons – Why do seasons change?

Tasks:

Read through the material below and **complete the tasks 3 and 4** (page 17)

➔ (Task 5 is wrongly marked as ,task 4'. This task is a **voluntary extra task**)

This YouTube link will help you understand the material:

[https://www.youtube.com/watch?v= EJv6c4ogQE](https://www.youtube.com/watch?v=EJv6c4ogQE) (*The Simple Club – Warum gibt es Jahreszeiten?*)

Pause and replay the video if necessary.

Vocabulary help:

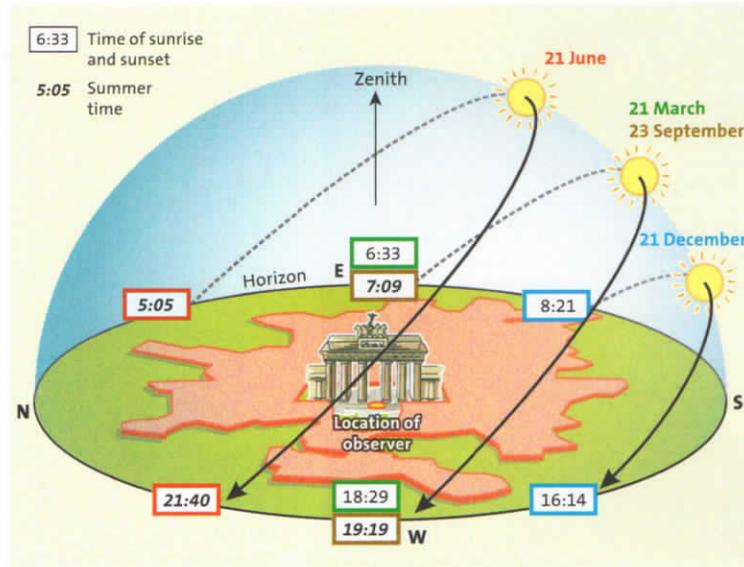
Task 3: **angle** = *Winkel*

to locate = *verorten, den Standort bestimmen*

Task 4: **tilted** = *geneigt, schräg*

axis = *Achse (M5)*

Task 5: **latitude** = *geographische Breite*



1 Position of the Sun at different times of the year in Germany

The seasons

zenith

Zenit; Senkrechtstand der Sonne

seasons

Jahreszeiten

equator

Äquator

dry season

Trockenzeit

rainy season

Regenzeit

humid

feucht

to rotate

rotieren, umkreisen

tilted

geneigt

angle

Winkel

latitude

Breitengrad

hemisphere

Hemisphäre, Halbkugel

Tropic of Capricorn

südlicher Wendekreis

Tropic of Cancer

nördlicher Wendekreis

The year has **seasons**. Countries like Germany which are quite far from the **equator** have up to four seasons: spring, summer, autumn and winter. In these regions it is warmer in summer and colder in winter.

Closer to the equator you will find only two seasons: a **dry season** and a **rainy season**. Around the equator it is hot and humid all year round. There are no seasons at all.

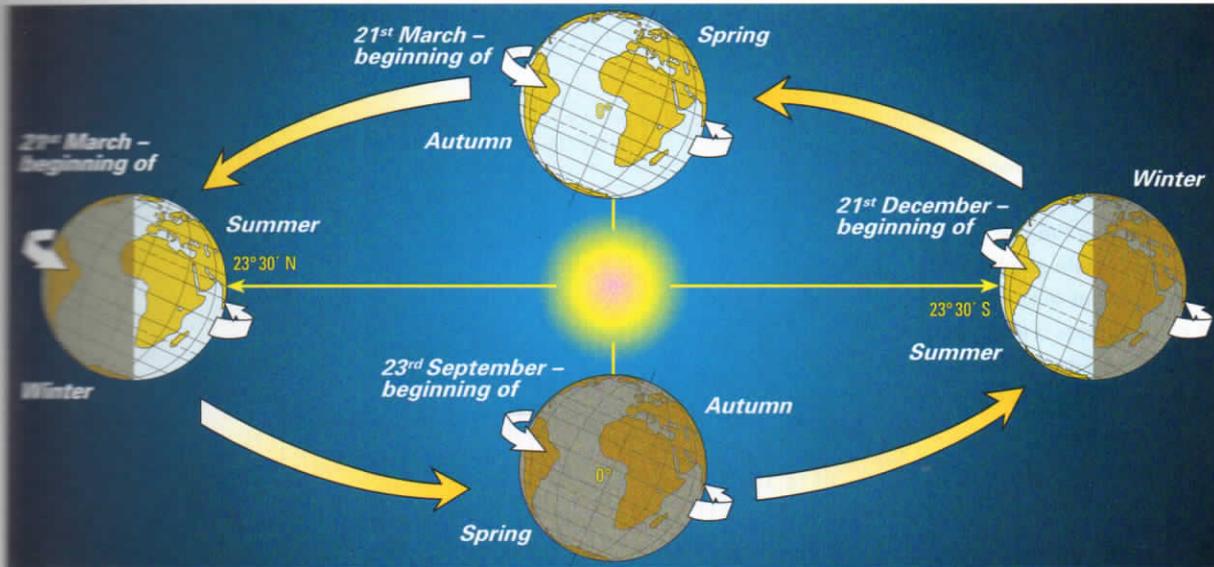
Some simple facts explain the seasons

1. In one year (365 days) the earth rotates around the sun.
2. The axis of the earth is tilted at 23.5 degrees.

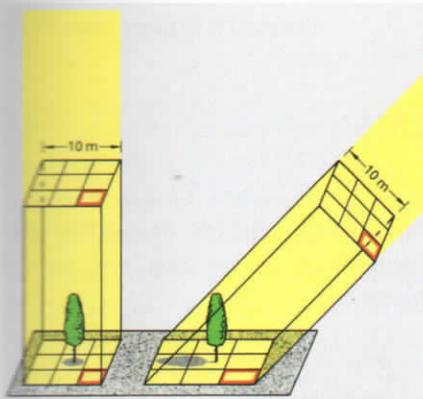
This means during our summer the **northern hemisphere** is tilted towards the sun. This means there is more energy, it is warm. At the same time it is a lot colder in the **southern hemisphere** because it is tilted away from the sun (see figures 5 and 6). In our winter it is the other way around. During one year the position of the sun moves between 23.26° north (**Tropic of Cancer**) and 23.26° south (**Tropic of Capricorn**) of the equator.



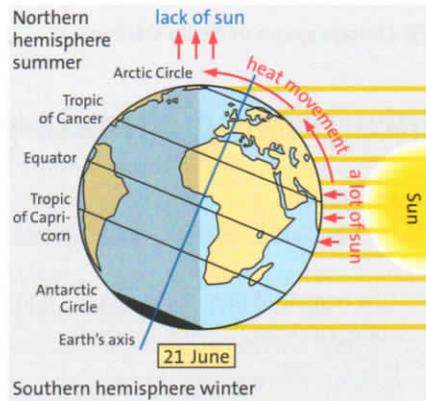
2 A tree in four seasons



3 The earth rotates around the sun



4 A straight angle heats up the earth more than a flat angle



5 Summer in the northern and winter in the southern hemisphere



6 Palm tree in the sun

surface
Oberfläche
lack of
Mangel an

1 Figure 5 shows the summer situation in the northern hemisphere. Draw a diagram to show the situation in winter.

2 Find out which climatic regions are between the Tropic of Cancer and the Tropic of Capricorn (atlas).

3 Photo 6 shows a palm tree in the sun.
a) At which angle was the sun when the picture was taken?

b) Locate the place of the photo on fig. 5.

4 Explain why there are different seasons. Use your own words.

Phrases to help you:

- the earth is tilted on its axis.
- directly over the equator
- the earth rotates around the sun
- at the beginning of spring / summer / ...

4 "The effect of the solar radiation depends on latitude." Explain this statement.

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Proposal for solution

Task 3a) 90-degree angle

Task 3b) Tropic of Cancer (= nördlicher Wendekreis), see text (page 16)

Task 4)

The earth rotates around the sun. Because the earth is tilted at an angle of 23.5 degrees, the angle of incoming solar radiation changes over the year.

At the beginning of summer (21 June), the northern hemisphere is tilted towards the sun. A larger surface area on the northern hemisphere is lit by the sun, at a higher angle compared to the southern hemisphere (M3, M4, M5). Days are longer, more sunlight is absorbed and top temperatures are generally higher in the northern hemisphere. During summer in the northern hemisphere, it is winter in the southern hemisphere.

In winter, starting at 21 December, the southern hemisphere is tilted towards the sun. A smaller surface area is lit by the sun, at a lower angle compared to the southern hemisphere (M3, M4). Days are shorter, less sunlight is absorbed and top temperatures are generally lower in the northern hemisphere (M3, M4). During winter in the northern hemisphere, it is summer in the southern hemisphere.

At the beginning of spring, the sun shines at a 90-degree angle over the equator at noon. This means that the northern and southern hemisphere receive an equal amount of sunlight over the day. Because days are getting longer in spring, plants start growing and producing leaves again (M2). To the contrary, days in the southern hemisphere are getting shorter and many plants lose their leaves in temperate areas (= gemäßigte Klimazone).

At the beginning of autumn, the sun is again at a 90-degree angle over the equator at noon. Again, the northern and southern hemisphere receive an equal amount of sunlight. Because days are getting shorter in autumn, many plants throw off their leaves (M2). To the contrary, days in the southern hemisphere are getting longer and plants start growing and producing leaves again in the southern hemisphere.