



Seasons around the world

Seasons

time

40 minutes

learning outcomes

To:

- discover that at the Equator there is very little difference between the seasons
- learn that the seasons are determined by the angle at which the rays of the Sun reach the surface of the Earth
- see that light that falls on a surface diagonally covers a larger surface area
- see that light that falls on a surface from directly overhead covers a smaller surface area
- discover that the Sun warms a smaller area more quickly than a large area

end product

- a model of Earth to help explain the differences between the seasons

materials needed

- 38 cocktail sticks
- 13 pens
- 13 torches
- 13 oranges

Preparation

For the activity **Hot or cold?** you will need to make a model of the Earth from an orange. Make sure you can make the classroom dark.



Right-angle or diagonal 10 min.

Turn off the lights and close the blinds in the classroom. Organise the children into pairs. Give each pair a torch and encourage them to shine it onto their table at different angles. Can they see a difference in the size of the area covered by the light? Explain that light shone at a shallow angle covers a larger surface area than light shone from a right-angle. The children complete [Task 1](#) on the worksheet.



The children investigate the relationship between the seasons and the angle at which the light from the Sun falls upon the Earth.



Hot or cold? 25 min.

Give each pair of children an orange. Explain that the orange represents the Earth. The top of the orange is the North Pole. The bottom of the orange is the South Pole. The children complete [Task 2](#) on the worksheet, up to step 11.

Discuss the tasks. Explain that the larger the surface area on which the sun shines, the larger the area over which the heat from the Sun is spread. So each part of that area gets less heat than when the light from the Sun is concentrated on a smaller area. At the Equator the Sun shines at a right-angle onto the Earth's surface, so it falls on a smaller area. This means it is hotter at the Equator. Together, look at the drawings on the worksheet. Use your orange to show that the Earth is tilted slightly diagonally. Rotate the orange around the torch. Start with the North Pole turned away from the Sun. Now the children can see that sometimes the North Pole is turned towards the Sun, and sometimes away from it. Show that the Sun shines more directly on our country when the North Pole is turned towards the Sun than when the North Pole is turned away from it. Explain that the seasons on Earth are caused by the different angles at which the Sun's rays hit the earth. That is why it is hotter in the summer than in the winter. Discuss with the children that the sunlight always falls on our country diagonally. You can tell this because there are always shadows. Even in the middle of the summer at noon when the Sun is directly overhead.



The children complete the rest of Task 2 on the worksheet. Explain that in our country the Sun does not shine as long in the winter as in the summer. Explain that this is because of the angle of the Sun in relation to the surface of the Earth. Because the angle of the Sun shining on our country changes throughout the year, we experience different seasons. This is because the amount of heat and light changes.



Not everywhere has different seasons 5 min.

The children complete Task 3 on the worksheet. Ask why we have such different seasons in our country, while the countries on the Equator do not. Come to the conclusion that this is because of the angle at which the Sun shines on the Earth's surface. Refer back to the activity **Right-angle or diagonal**.



Seasons around the world

1 *Right-angle or diagonal*



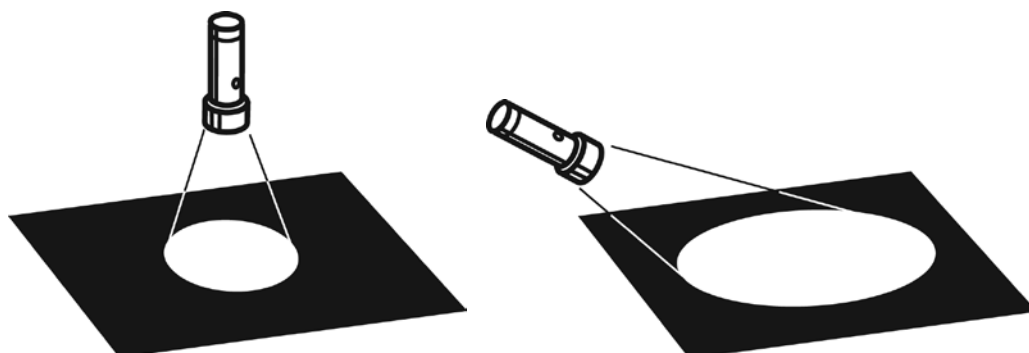
You have just been looking at the rays of light coming from the torch.

Did it look like the drawing? Circle the correct answer.

a

The area of light is larger if you shine the torch

diagonally / at a right-angle on the table.



2 *Hot or cold?*



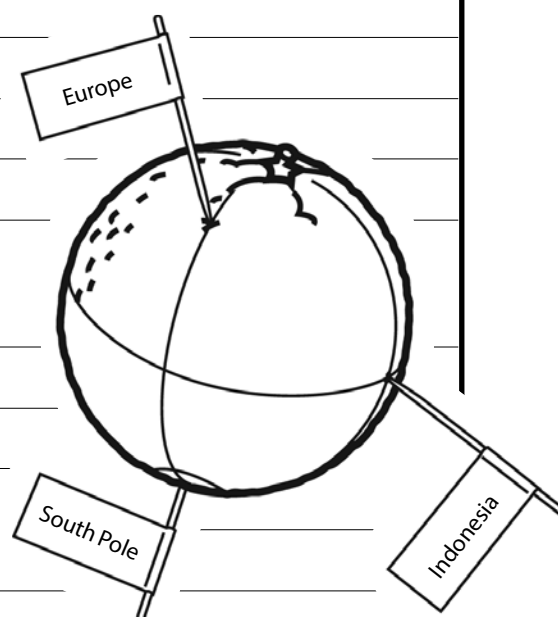
What do you need?

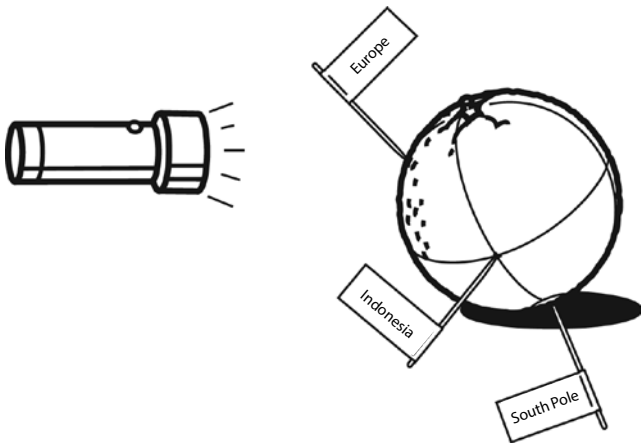
- orange
- pen
- 3 cocktail sticks
- sticker(s)

What are you going to do?

Carry out this task with someone else.

- 1 Divide the orange into four equal parts as shown in the drawing.
- 2 Draw the Equator around the middle of the orange.



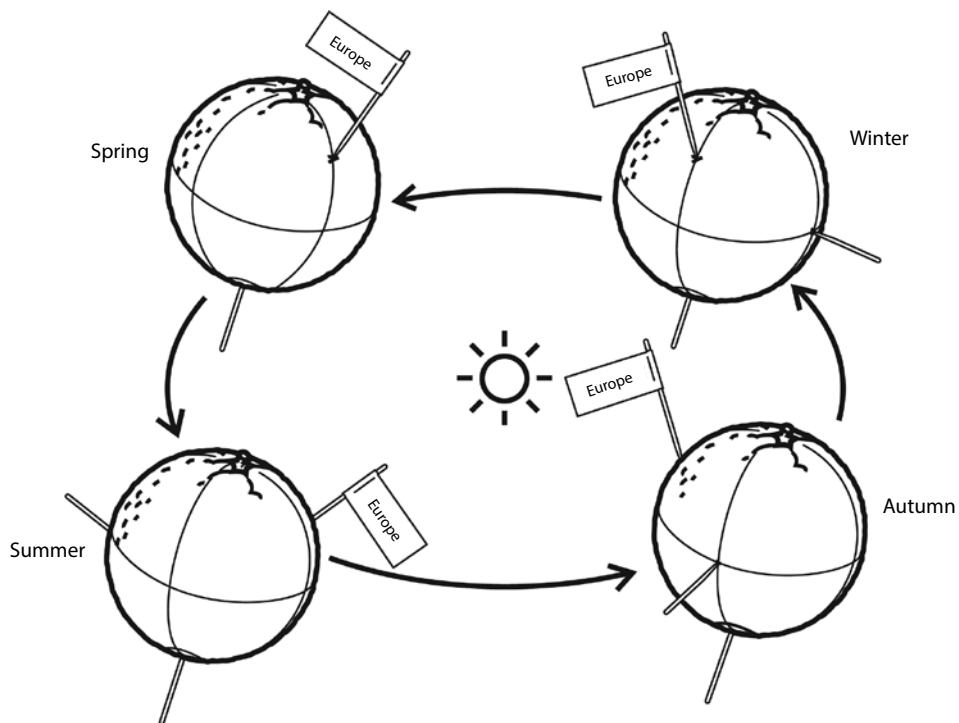
	3 Stick a cocktail stick in the bottom of the orange to show the South Pole.
	4 Stick a cocktail stick on a vertical line between the North Pole and the Equator as shown on the drawing. This represents where you live. Stick a sticker on the cocktail stick to help you recognise it later.
	5 Turn the orange a quarter turn to the left. The cocktail stick showing where you live is now on the left. Stick a cocktail stick on the intersection of the vertical line and the Equator, like the third cocktail stick in the drawing. This is Indonesia.
	6 Hold the orange at a slight angle, like in the drawing below. Shine the torch on the cocktail stick showing where you live. Hold the torch 15 centimetres away from the orange.
	
	7 Get your partner to draw a line around the area on the orange where the light is shining.
	8 Now shine the torch from 15 centimetres away from the side onto Indonesia.
	9 Get your partner to draw a line around the area on the orange where the light is shining now.
	10 Look at the two circles. Circle the correct answer.
	The area lit up where I live is
	larger / smaller than the area in Indonesia (on the Equator).

CIRCLE
the correct
answer



11 Below you can see four drawings. They show the position of the Earth in the different seasons.

Experiment shining the torch on your orange as shown in each of the drawings to see how the light falls on the surface. Turn the torch along with the orange.



a The rays of the Sun always fall

at more of a right-angle / more diagonally

where I live than on Indonesia.

b In which season do we have the least sunlight here?

c In which season do we have the most sunlight here?

CIRCLE
the
correct
answer

write your
answer
HERE

3	Not everywhere has different seasons
a	What is the connection between the Sun and the seasons?
b	Why is there very little difference in the seasons in the countries on
	the Equator, such as Indonesia?