



Sheet 2

Modelling Earth's movement and changes throughout the day

Investigation question: What effect does Earth's movement have on the sunlight we see throughout the day?

What you will need:

- world globe or large ball
- two toothpicks (if using a large ball)
- torch
- re-usable adhesive
- marker (small piece of coloured paper)

Preparation:

1. If you are using the large ball, attach toothpicks with re-usable adhesive at opposite ends to create the 'axis'. The globe or ball is 'Earth'.
2. Attach the marker near the 'equator' on 'Earth'.
3. Before you turn on the torch, make a prediction about the changes you think you will observe in the light on the marker as Earth rotates.

Predict

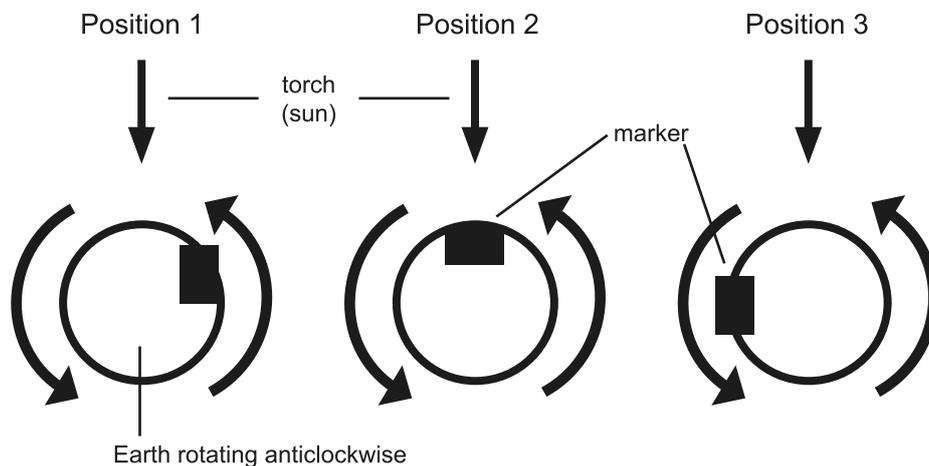
What do you think you will observe when 'Earth' rotates?

I predict

the light on the marker will change from not much light to fully lit up, to not much light again because Earth rotates, so the marker moves towards the sun then away again.

Conduct the investigation:

- a. Have another person rotate 'Earth' anticlockwise on its axis while you shine the torch (sunlight) onto 'Earth'. Make sure you hold the torch still.
- b. Observe the type of light shining (for example: bright, fading, no light) on the marker as 'Earth' rotates.
- c. Swap roles and make observations from the different position.
- d. Rotate Earth through the three positions shown and then completely around to Position 1 again. Record your observations in the table.





Observations:

| Marker position | Type of light (bright/fading/increasing/no light) | What time of day is it? (morning/midday/afternoon/night) |
|-----------------|--|---|
| 1 | The light on the marker is dull but is going to get brighter. | morning |
| 2 | The light on the marker is really bright and is shining right onto it. | midday |
| 3 | The light on the marker is getting dull again and it is going into the dark. | afternoon |

Focus questions:

Q: Was the light the same strength or brightness at each position?

A: Circle: Yes No

Q: At which marker position is the sunlight likely to be the brightest?

A: Position 2

Q: Where on the globe could the marker be positioned to receive no sunlight?

A: on the side facing away from the sun

Q: Why are there changes in the sunlight observed on the marker?

A: As Earth rotates, it takes the marker towards the sun and then away from it, so the light on the marker changes. Around the back of the ball, the marker would be in the dark, which would be night-time. Then the marker comes around and starts to be lit up again.



Sheet 3

Where on Earth are you?

Instructions:

Draw where you would stand on the surface of Earth at the time of day stated in the left-hand column. Be able to explain why you drew yourself in that position.

The larger circle represents the sun. The smaller circle represents Earth.

The view point is top-down, that is, looking down on the North Pole. The first one has been done for you.

| | | |
|---------------------|--|--|
| Middle of the night | | |
| In the morning | | |
| At midday | | |
| In the afternoon | | |



Focus questions:

Use your knowledge of Earth's rotation to help you answer these questions:

1. Explain your decision for where you are in the morning diagram.

Because Earth rotates in an anticlockwise direction, I drew myself at the point where I am just coming into the light of the sun from the dark side of Earth.

2. Explain your decision for where you are in the midday diagram.

Now I am right in front of the sun, getting the most light.

3. Explain your decision for where you are in the afternoon diagram.

Because Earth rotates in an anticlockwise direction, I drew myself just about going into the dark again because afternoon is just before the night.