



Incoming solar radiation

We can demonstrate by means of a globe, a piece of black cardboard and a spotlight or lamp why solar radiation heats the spherical Earth differently.

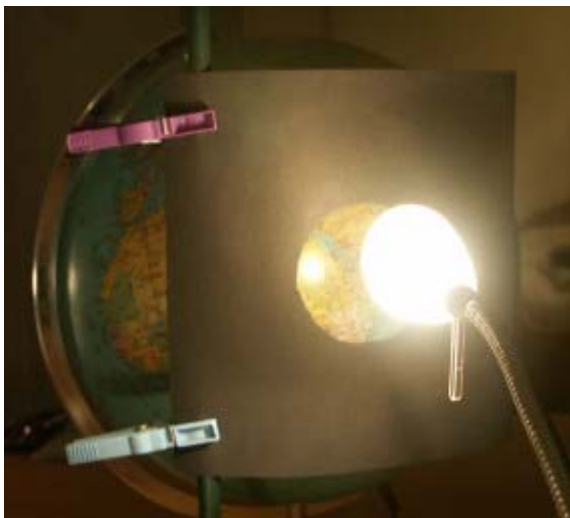
Material

Required are:

- 1 globe
- 1 lamp / spotlight with directional radiation
- 1 piece of black cardboard, about 20 x 20 cm
- support material (stand)
- scissors, spring bow compass



Fotos auf dieser Seite: Elmar Uherek



Setup

A round hole is cut into the black cardboard by means of spring bow compass and scissors. The cardboard is fixed between lamp and globe with the help of a stand in a way that the light of the lamp forms a sharp circle or oval on the globe.

For the following procedure it is important to keep the distance between lamp, cardboard and globe constant. It has some advantages if the light from the lamp is directional but if the light source is not too much point-shaped. In contrast to a lamp or a spot light with a diverging light cone the sun rays are nearly parallel, since the Sun is far larger than the Earth.





Simulation of solar radiation in different latitudes

If we shift the lamp and the cardboard in height relative to the globe, the light beam strikes the globe in different areas. We can move it from the equator to the pole. Since the direction of the rays is still the same, their inclination on the globe changes. The closer we are to the pole, the larger the area which is illuminated by the same energy.



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