

toward the east and the sun's light passes along over to the west. This motion of the earth makes the sun appear to rise in the east, move westward across the sky all day, and sink below the horizon in the evening. Turn the globe yourself and watch the white dot come into the light. That is its sunrise. Notice it go out of the sunshine again. That is its sunset.

It is the turning of the earth once around in every twenty-four hours that makes day and night. It took men a long time to find this out; but we can easily see how it is, now that the truth is known. The earth is turning round before the sun, making daylight over half the world. The other half is in the dark which we call night.



Now we shall thrust a knitting-needle or a hat-pin through a large apple, or ball. Now light a lamp and close the blinds. Let us hold the apple, or ball in the light and make it turn round on the wire. We shall stick a postage

stamp or a bit of colored paper on the spot we wish to watch. There it goes; now it is in the light. The stamp is at sunrise. Now it is directly in front of the light. Now the stamp has its noontide. Now it is passing out of the light into the shadow. The sunset of the stamp has come, and its night also follows.

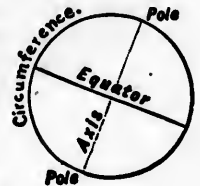
The wire passing through the centre of the apple or the ball may be called the *axis*. Now the earth turns round on an axis in the same way that your apple or ball does. But there is no rod of iron or of anything thrust through it. It floats free like a balloon, or a large soap-bubble such as boys and girls love to blow. All the time, however, it keeps turning on its axis before the sun. Put another larger stamp on your ball opposite the first stamp. Call the little one America and the big one Asia. See, now, as we turn, when it is day in America, it is night in Asia. Asia again emerges into light, and our pretended sun no longer shines on America, which is now passing through the shades of night. So it happens that, when we have daylight, the people on the other side of the earth have night and dark-

ness. We can turn our little ball on its axis in a few seconds; but it takes the huge world twenty-four hours to turn round, or *rotate*, on its axis, making for us just one day and one night.

The ends of the earth's axis are two points on the surface. The one at the north is called the *north pole*, and straight over it we see the North Star which you must learn to find in the sky. The other end of the axis is, of course, exactly opposite at the south. It is called the *south pole*. This word pole means "turning point." If you spin a top very fast you can see a pole on the upper part of the top.

Now draw a white line round our apple or ball, exactly midway between these two poles. It is a ring or circle and may be called the *equator*. If we cut the apple or ball through and through along this line we shall make the northern and the southern *hemisphere*. You may notice that the equator runs exactly east and west. Certainly, nobody can draw a line all the way round the earth; but we can easily think or imagine such a line.

Such lines are therefore called *imaginary lines*, and there are several more to be learned by and by. The picture shows clearly the meaning of *pole*, *axis* and *equator*. The circle round the earth is called its *circumference*.



ORAL AND WRITTEN EXERCISES.

(Use complete sentences in the answers.)

What does the bright hemisphere of the globe or the apple represent on the earth? What does the dark hemisphere of the ball represent? What line does the wire or the hat-pin represent? With respect to the sun and the earth, what does the lamp represent? Which way does the earth turn on its axis? Turn your ball or globe so as to make the sun (lamp) rise in the west. If the earth rotated twice as fast, how would the days and nights be altered in length? What kind of day and night should we have if the earth stood still for a month? How often would the sun rise? Draw a figure and explain the meaning of *circumference*, *axis* and *equator*. Make your figure very large. When you are on a fast train, which way do the trees and telegraph poles seem to move? When the earth turns to the east, which way do the sun and the stars seem to move? When the children of Canada are eating their noon meal, what time of night will it be on the opposite side of the world? Which is larger, the northern or the southern hemisphere? Give reasons for your answer. Why are there no moonlight nights when the sun and the moon happen to be on the same side of the earth? What are imaginary lines? Mention some. Draw an imaginary line in a picture of the school room. What is the direction of the equator?