

As the Plate Tilts

Directions

1. Tilt the plate in various directions, observing the shadow created by the straw on the plate. What changes about the shadow? What is unchanged? Write your answers in your science notebook.
2. Can you tilt the plate so that the straw creates no shadow at all? Describe how you did this and draw a picture to show your explanation.
3. Imagine that the straw on the plate is a person. If that person wanted to look at the light bulb, which way should they look when you hold the plate as you did in #2?
4. Remember when we traced our shadows? At what time of day was your shadow most like the shadow in #2? Was it exactly the same? Where was the sun when we measured that shadow?
5. Imagine that the light bulb at the center of the class is the sun. Find a way to hold the plate so that the shadow of the straw "person" is quite long, and points to the west, the direction indicated on the plate by a "**W.**" At what time of day were our shadows long and pointed to the west? If the straw "person" were to look at the sun (straw "people" have eyes that will not be harmed by light-bulb "suns"), where should he or she look? Where was the sun at the time you found?
6. Find a way to hold the plate so that the shadow of the straw "person" is quite long, and points to the east, the direction indicated on the plate by a "**E.**" At what time of day were our shadows long and pointed to the east? If the straw "person" were to look at the sun, where should he or she look? Where was the sun at the time you found?
7. Holding your plate vertical (straight up and down, with the straw pointing away from your body), turn the plate so that the straw "person" thinks it is:
 - Morning
 - Noon
 - EveningWhat would night look like?
8. Now tilt your plate towards you a little, while still keeping it mostly vertical (so that if there was food on it, it would still slide off). Re-create the morning, noon, and evening shadows from problem 7 with this tilt. What is different about these shadows from the shadows you made in problem 7? Why do you think the shadows changed? Which situation is more like what we found when we traced our shadows?
9. Do different parts or sections of your shadows seem darker than other parts? Do some parts or sections seem lighter than other parts? Use different shades of gray or black to show the different parts of your shadow. Describe what you think is happening to cause the light and dark parts of your shadows.