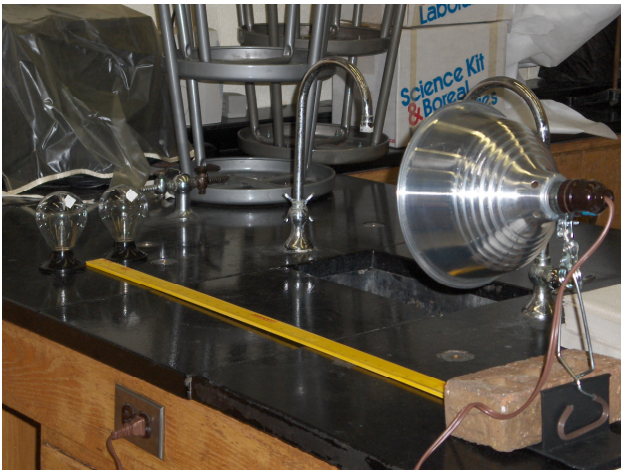


Lamp, spinners, and yard stick

1. Start with the light bulbs ('spinners') at the same distance from the lamp.
2. Turn on the lamp and wait about 15 seconds.
3. Do the spinners rotate at about the same rate?
4. Place one of the spinners about 18" from the lamp and the second spinner about 36" from the lamp.
5. Wait about 15 seconds. What do you observe?
6. Would you say that the spinner at 18" is a) spinning twice as fast, b) more than twice as fast, or c) less than twice as fast as the spinner at 36"?
7. Try placing the spinners at various distances from the lamp.
8. What do you think causes the differences you observe?
9. Turn off the lamp and place the spinners at the same distance. The station is now ready for the next person.



Distance to Sun and the Intensity of Sunlight (Lamp, spinners, and yard stick)

Summary – This activity investigates the role of the distance between the sun and the earth (or another planet) and the effect this has on the intensity of sunlight. The relationship is not entirely straightforward. The sunlight's intensity is inversely related to the square of the distance between the sun and the planet.

Materials Needed

- 2 radiometers (available from science supply companies)
- Heat lamp and tabletop stand
- Yard stick

Scientific Questions

How does the distance between the sun and a planet affect the intensity of sunlight?

Possible Hypothesis

- Distance has no effect on intensity
- Objects that are closer to the sun receive more intense sunlight
- Objects that are farther from the sun receive more intense sunlight

Set up

- Shine the heat lamp parallel to the tabletop and directly down the length of the yard stick.

Notes

- The factor that causes the radiometer to spin is fairly complex and often explained incorrectly. It's enough for you to know that the spin rate depends on the intensity of the light.
- The radiometer at 18" will spin at about 4 times the rate of the radiometer at 36". This illustrates the inverse square relation between intensity and distance. While the spin rate is too fast to count, students may be able to determine that the spin rate of the radiometer at 18" is more than twice that of the radiometer at 36".