

Specular (Regular) versus Diffuse Reflection

Read from **Lesson 1** of the **Reflection** chapter at **The Physics Classroom**:

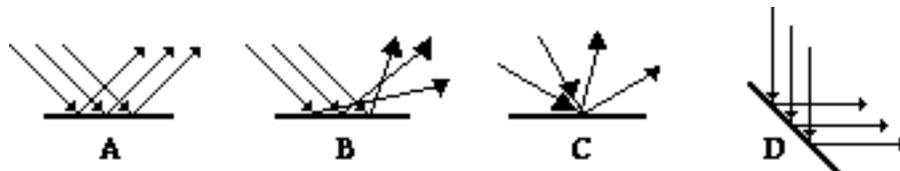
<http://www.physicsclassroom.com/Class/refln/u1311d.html>

MOP Connection: Reflection and Mirrors: sublevel 4

1. Describe the difference between diffuse reflection and regular (or specular) reflection.

2. Explain what causes light rays to undergo diffuse reflection.

3. Which one of the following diagrams depicts diffuse reflection? _____

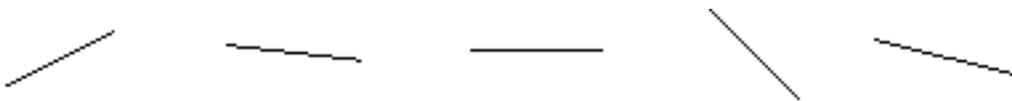


4. **True or False:**

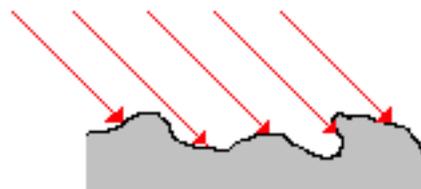
When a beam of light undergoes diffuse reflection, individual rays within the beam do NOT follow the law of reflection.

Explain your answer.

5. For each of the five surfaces given below, draw normal lines.



6. Consider the diagram at the right of five rays of light approaching a microscopically rough surface. For each incident ray, estimate the normal line and draw the corresponding reflected ray of light.



Light, Reflection and Mirrors

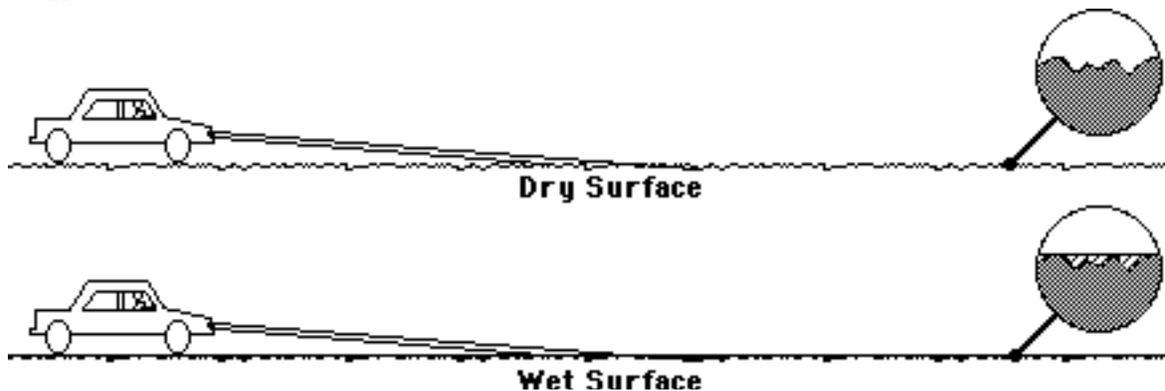
7. Identify whether the following phenomenon are attributable to diffuse reflection (DR) or regular reflection (RR):
- The image of a mountain can be clearly seen in the calm waters of a lake. _____
 - A lacquered tabletop produces a glare of the lamp bulb in the overhead light. _____
 - Water is sprayed onto a sheet of paper. A laser beam is directed towards the paper, reflects and produces a red dot on the ceiling. _____
 - Light from the overhead lights strikes your body and reflects towards all your classmate's eyes. _____
8. A microscopic view of a sheet of paper is shown in the diagram at the right. Would you expect this sheet of paper to cause light to undergo regular or diffuse reflection? _____ Explain.



A microscopic view of a sheet of paper.

9. From what type of surface do you think it would be easier to read? From pages, which are rough, or from pages which are smooth and glossy? _____ Explain your answer.

10. Driving at night offers a great example of diffuse vs. regular reflection. A dry road is a diffuse reflector, while a wet road is not. On the diagrams below, sketch the reflected light off a wet and dry surface.



Why would the wet road appear to the driver to be darker than the dry road?

11. The diagram below contrasts the reflection of light off a smooth surface (left) with the reflection of light off a rough surface (right). Compare the two diagrams and explain why the reflected rays for a rough surface do not result in the formation of an image.

