# أوراق عمل درس The light of nature من وحدة light of Fundamentals منهج انسباير



## المزيد من الملفات بحسب الصف الثاني عشر المتقدم والمادة فيزياء في الفصل الأول

| | |
|---|---|
| 1 | حل مراجعة دروس وحدة Light of Fundamentals منهج انسباير |
| 2 | ملزمة الوحدة الثانية المجالات الكهربائية وقانون غاوس أسئلة مهارية وامتحانية |
| 3 | ملزمة الوحدة الأولى القوى الكهروستاتيكية أسئلة مهارية وامتحانية |
| 4 | المراجعة النهائية للوحدة الأولى القوى الكهروستاتيكية |
| 5 | ملخص وأوراق عمل درس القوى الكهروستاتيكية وقانون كولوم من الوحدة الأولى |

## Subtopic 7.2: The Nature of Light

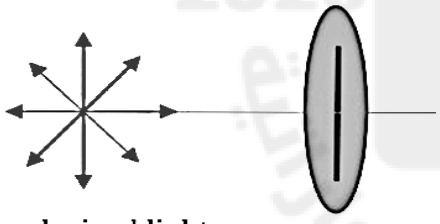
1. What is the bending of light as it passes the edge of a barrier called?

A. Reflection
B. Refraction
C. Diffraction
D. Polarization

2. What do astronomers use to help determine how objects such as galaxies move relative to Earth?

A. Doppler shift
B. Light reflection
C. Light refraction
D. Light shift

3. A polarizing filter is placed in front of an unpolarized light source as shown below.

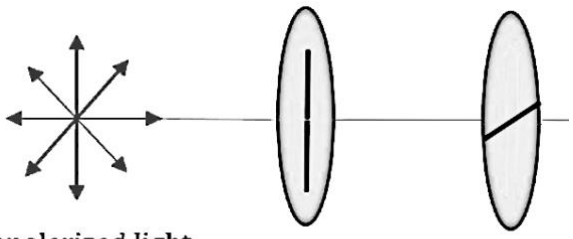


Unpolarized light of intensity $I_o$

How much of light is blocked by this single polarizing filter?

A. 0%
B. 50%
C. 75%
D. 100%

4. Two polarizing filters are placed in front of a light source.



Unpolarized light of intensity $I_o$

If the axis of the two filters are perpendicular to each other, how much of the light is blocked by them?

A. 0%
B. 50%
C. 75%
D. 100%

5. Polarized light consists of waves ___ with a specific pattern.

A. fixed
B. oscillating
C. combining
D. traveling

**Free Response:**

1. Match the descriptions in the table to the terms below.

**Polarization** **Wavelength** **Malus's Law** **Diffraction**

| Description | Term |
|---|---|
| The shortest distance between points of a wave where the wave pattern repeats itself, such as from crest to crest or trough to trough | |
| the bending of light as it passes the edge of a barrier | |
| production of light with a specific pattern of oscillation | |
| law that explains the reduction of light intensity as light passes through a second polarizing filter | |

2. Fill in the blacks by choosing the appropriate term from the brackets.

a. The clear-edged quality of the shadow that results when you put your hand in the path of light from a flashlight illustrates that light travels in a _____(straight/ curved) line .

b. The waves that cannot pass through a polarizing filter are those whose electric fields are vibrating _____(parallel/perpendicular) to the polarizing axis

3. Explain how Huygens' principle explain the blurred edges of the shadow around the edges.

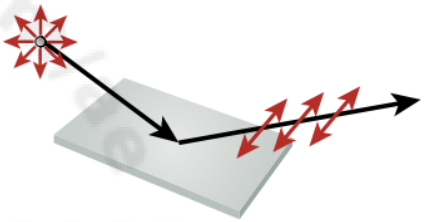
4. Explain why polarization by filtering decreases the intensity of light.

5. Two polarizing filters are lined up. The light entering the first is 100 lm. Use Malus's law to complete the table below.

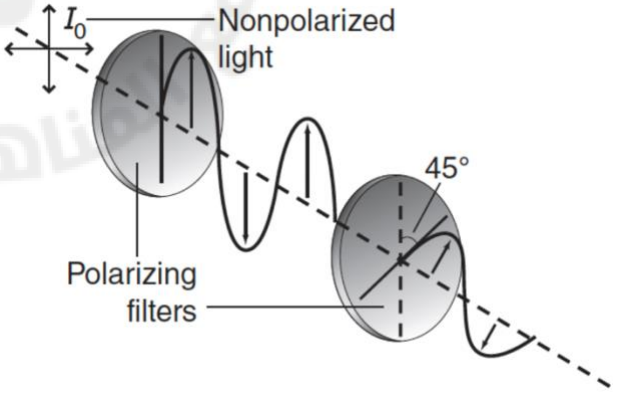
| Angle between Filters | Intensity of Light after Passing through Second Filter |
|---|---|
| 90° | |
| 0° | |
| 60° | |

6. Describe a simple experiment you could do to determine whether sunglasses in a store are polarizing.

7. Use the figure below to determine the direction the polarizing axis of polarizing sunglasses should be oriented to reduce glare from the surface of a road: vertically or horizontally? Explain.



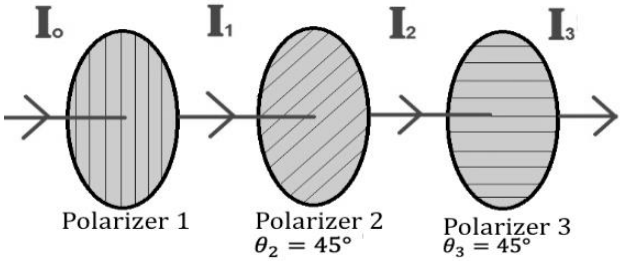
8. Nonpolarized light of intensity $I_0$ is incident on a polarizing filter, and the emerging light strikes a second polarizing filter, as shown.




a. What is the light intensity emerging from the first polarizing filter?

b. What is the light intensity emerging from the second polarizing filter?

9. Unpolarized light is passed through polarizer 1. The light then goes though polarizer 2 with its plane of polarization at 45.0° to that of polarizer 1. Polarizer 3 is placed after polarizer 2. Polarizer 3 has its plane of polarization at 45° to the plane of polarization of polarizer 2 and at 90° to that of polarizer 1 as shown below.




What fraction of the intensity of the original light $I_0$ gets through:

a. The polarizer 2?

b. The polarizer 3?

c. Suppose the second polarizer is removed. What is the intensity of light transmitted by the two (i.e., first and third) polarizers now?

10. What are the only factors involved in the Doppler effect for light between a source and an observer?

11. A hydrogen atom in a galaxy moving with a speed of $9 \times 10^6\ m/s$ toward Earth emits light with a wavelength of 555 $nm$. What wavelength would be observed on Earth from that hydrogen atom?

12. How fast is a galaxy moving relative to Earth if light from hydrogen's spectrum of 486 $nm$ is redshifted to 491 $nm$?

13. Describe the relative motions of objects when light is redshifted and when light is blueshifted. Answer using the term Doppler effect.