

The Science of Light Test Answers

1. A

2. B

3. D

4. When light is reflected, it is bounced back off a surface. When it is refracted, it passes from one material, such as air, into and through another material of different density. When light passes into the denser material, it slows and is bent.

5. Examples include: soap bubbles, rain, jewelry, compact disc, hose spray.

The Technology of Light Test Answers

1. C

2. A

3. D

4. A short circuit is any circuit that has been interrupted, so that the current can't flow completely through it.

5. A fuse is a weak section of a circuit that breaks when too much current is put through the circuit.

The Math of Light Test

Multiple Choice

1. A 100-watt incandescent light bulb burns for 6 hours each day 7 days per week. The cost per kilowatt is 0.0005 cents per hour. How much does the energy for the lamp cost for the week?

- A. \$2.10
- B. \$0.042
- C. \$0.021
- D. \$0.21

2. Which term refers to the amount of light falling on a surface?

- A. voltage
- B. light intensity
- C. wattage
- D. illuminance

3. Which term does NOT refer to light intensity?

- A. watt
- B. lumen
- C. candlepower
- D. candela

Constructed Response

4. Describe in your own words how to calculate the average monthly energy cost of a lamp.

5. If a 60-watt light bulb gives off 880 lumens, about how much does a similar 40-watt bulb give off? Label and show your work.

The Math of Light Test Answers

1. C

2. D

3. A

4. Light bulb wattage multiplied by the cost of a watt multiplied by hours used each month.

5. 580 lumens.

The History of Light Test

Multiple Choice

1. Which job did Thomas Edison NOT have during his lifetime?
 - A. telegraph operator
 - B. newsboy
 - C. businessman
 - D. farmer

2. Which job did Lewis Latimer NOT have during his lifetime?
 - A. writer
 - B. wallpaper hanger
 - C. professional musician
 - D. Navy man

3. Why do light bulbs have short filaments?
 - A. Long filaments do not glow as brightly.
 - B. Short filaments last longer.
 - C. To keep the vacuum in the bulb.
 - D. Tungsten is a short material.

Constructed Response

4. List two achievements of Lewis Latimer besides his inventions.

5. Put the following events in the correct order:
People used oil lamps for light.
People used fire for light.
People used the electric light bulb for light .
People used candles for light.

The History of Light Test Answers

1. D

2. C

3. A

4. List could include: served in the Navy; taught himself drafting, electrical engineering, and German and French; wrote a book on electrical engineering; wrote poetry; wrote plays; helped found "Edison's Pioneers"; helped found a church; etc.

5. People used fire for light. People used candles for light. People used oil lamps for light. People used the electric light bulb for light.

Unit Test

Multiple Choice

1. Which phrase best describes a *photon*?
 - A. refracted light wave
 - B. gamma ray
 - C. packet of energy
 - D. sound wave

2. Which is NOT part of the electromagnetic spectrum?
 - A. radio waves
 - B. microwaves
 - C. water waves
 - D. x-rays

3. Which phrase best describes the most powerful EM radiation?
 - A. longer wavelength
 - B. shorter wavelength
 - C. x-ray
 - D. radio wave

4. Which type of light bulb is the most powerful and efficient?
 - A. incandescent
 - B. halogen
 - C. fluorescent
 - D. high-intensity discharge

5. The Inverse Square Law says that if you double the distance between you and a light source, the light will be
 - A. one-tenth as bright
 - B. half as bright
 - C. twice as bright
 - D. equally bright

Constructed Response

6. Why does a dark-colored car get hotter sitting in the sun than a light-colored car?

7. Write a step-by-step description of how a fluorescent bulb lights up. Use sentences such as the following:

- An electric current arcs between the ballasts.
- Electricity heats gas in the tube.
- Hot gases make the glass coating glow.
- Electricity flows through ballasts.

8. Why was the invention of a glass chimney for a candle lamp a significant achievement?

9. List at least three things Thomas Edison invented or improved.

10. Put the following events in the correct order:

People used oil lamps for light.

People used fire for light.

People used the electric light bulb for light.

People used candles for light.

Unit Test Answers

1. C

2. C

3. B

4. D

5. A

6. Since dark colors absorb light and light colors reflect them, a dark car will get hotter in the sunlight.

7. Electricity flows through ballasts. An electric current arcs between the ballasts. Electricity heats gas in the tube. Hot gases make the glass coating glow.

8. It protected the candle flame from wind, etc. It was the first major improvement in more than 1,000 years.

9. List could include phonograph (record player), electric light bulb, automatic telegraph, moving picture (movies), electric voting machine, etc.

10. People used fire for light. People used candles for light. People used oil lamps for light. People used the electric light bulb for light.