

Answer Key with Questions

Grade 9 Physics

1) Match the mirror and lens types with their descriptions.

Plane Mirror	_____	A) thicker in the middle than at the edges
Concave Mirror	_____	B) flat and smooth
Convex Mirror	_____	C) curved inward
Concave Lens	_____	D) thinner in the middle than at the edges
Convex Lens	_____	E) wavy
		F) curved outward

Correct Answer

Plane Mirror	←————→	flat and smooth
Concave Mirror	←————→	curved inward
Convex Mirror	←————→	curved outward
Concave Lens	←————→	thinner in the middle than at the edges
Convex Lens	←————→	thicker in the middle than at the edges

2) Which type of mirror can form real images?

- ☐ **A)** conical
- ☐ **B)** spherical
- ☐ **C)** convex
- ☐ **D)** plane
- ☐ **E)** concave

Correct Answer

E) concave

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3) Describe the image formed when an object is more than twice the focal length away from a concave mirror.

- ☐ **A)** inverted and enlarged
- ☐ **B)** upright and enlarged
- ☐ **C)** upright and reduced
- ☐ **D)** inverted and reduced

Correct Answer

D) inverted and reduced

4) Fill in the blanks using the available answer choices.

Mirrors _____ **light; lenses** _____ **light.**
(Blank 1) (Blank 2)

Blank 1 options

- reflect
- refract
- emit
- absorb

Blank 2 options

- reflect
- refract
- emit
- absorb

Correct Answer

reflect
refract

5) Which can your brain perceive though no light rays pass through them?

- ☐ **A)** lenses
- ☐ **B)** real images
- ☐ **C)** mirrors
- ☐ **D)** virtual images

Correct Answer

D) virtual images

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6) Which of these is always true about a real image?

- ☐ **A)** It can be projected onto a screen.
- ☐ **B)** It is reversed.
- ☐ **C)** It appears behind the mirror.
- ☐ **D)** It is enlarged.

Correct Answer

A) It can be projected onto a screen.

7) Light is refracted and spread out by

- ☐ **A)** convex mirrors.
- ☐ **B)** concave mirrors.
- ☐ **C)** concave lenses.
- ☐ **D)** convex lenses.

Correct Answer

C) concave lenses.

8) Describe the image formed by a concave lens.

- ☐ **A)** real
- ☐ **B)** virtual
- ☐ **C)** upright
- ☐ **D)** inverted
- ☐ **E)** reduced
- ☐ **F)** enlarged

Correct Answer

B) virtual
C) upright
E) reduced

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9) Fill in the blanks using the available answer choices.

A convex lens causes light rays to _____ the optical axis
(Blank 1)
and _____.
(Blank 2)

A concave lens causes lights rays to _____ the optical
(Blank 3)
axis and _____.
(Blank 4)

Blank 1 options

- refract toward
- refract away from
- reflect toward
- reflect away from

Blank 2 options

- converge
- diverge

Blank 3 options

- refract toward
- refract away from
- reflect toward
- reflect away from

Blank 4 options

- converge
- diverge

Correct Answer

refract toward
converge
refract away from
diverge

10) Fill in the blanks using the available answer choices.

A plane mirror forms a _____ image _____ the
(Blank 1) (Blank 2)
mirror.

Blank 1 options

- real
- virtual

Blank 2 options

- in front of
- behind
- on the surface of

Correct Answer

virtual
behind

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11) Which way does the lens shown bend incoming light that is parallel to the optical axis?



- ☐ A) away from its optical axis
- ☐ B) toward its optical axis
- ☐ C) away from its edges
- ☐ D) toward its focal point

Correct Answer

A) away from its optical axis

12) Match the statements with the corresponding vision problem.

Farsightedness

Nearsightedness

- _____ A) Nearby objects appear blurry.
- _____ B) Concave lenses correct this vision problem.
- _____ C) Convex lenses correct this vision problem.
- _____ D) Light rays converge before reaching the retina.
- _____ E) Faraway objects appear blurry.
- _____ F) Light rays reach the retina before they converge.

Correct Answer

Farsightedness



Nearby objects appear blurry.
, Light rays reach the retina before they converge.
, Convex lenses correct this vision problem.

Nearsightedness



Faraway objects appear blurry.
, Light rays converge before reaching the retina.
, Concave lenses correct this vision problem.

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13) What type of waves are sound waves?

- ☐ A) transverse
- ☐ B) longitudinal
- ☐ C) sonar
- ☐ D) radio

Correct Answer

B) longitudinal

14) The human perception of pitch primarily depends on ____.

- ☐ A) loudness
- ☐ B) resonance
- ☐ C) intensity
- ☐ D) frequency

Correct Answer

D) frequency

15) Which will you hear as the highest pitch?

- ☐ A) sound wave with frequency of 10,000 Hz
- ☐ B) sound wave with frequency of 50 Hz
- ☐ C) sound wave with frequency of 15,000 Hz
- ☐ D) sound wave with frequency of 30,000 Hz

Correct Answer

C) sound wave with frequency of 15,000 Hz

Explanation

Young, healthy humans have a hearing range of approximately 20 Hz to 20,000 Hz

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16) The ___ is the frequency at which a material tends to vibrate when it is disturbed.

- ☐ **A) pitch**
- ☐ **B) quality**
- ☐ **C) resonance**
- ☐ **D) natural frequency**

Correct Answer

D) natural frequency

17) In which medium will sound travel fastest?

- ☐ **A) steel**
- ☐ **B) water**
- ☐ **C) oil**
- ☐ **D) air**

Correct Answer

A) steel

18) Which sound wave property is most related to loudness?

- ☐ **A) amplitude**
- ☐ **B) wave speed**
- ☐ **C) frequency**
- ☐ **D) wavelength**

Correct Answer

A) amplitude

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19) If you are watching a moving train, what would happen to the pitch of the whistle at a crossing as the locomotive approaches and then passes by the crossing?

- ☐ **A)** The pitch would decrease and then increase again.
- ☐ **B)** The pitch would decrease suddenly as the train passed.
- ☐ **C)** The pitch would increase suddenly as the train passed.
- ☐ **D)** The pitch would remain the same.

Correct Answer

B) The pitch would decrease suddenly as the train passed.

20) Why might you want to wear earplugs during a rock concert?

Correct Answer

Answers may vary.

21) Fill in the blanks using the available answer choices.

Increasing the frequency of a sound wave will change the _____ of a sound.
(Blank 1)

Blank 1 options

- loudness
- intensity
- pitch

Correct Answer

pitch

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22) In a science fiction movie, a nearby spaceship explodes and you hear the explosion on your ship. Is this realistic? Why or why not?

Correct Answer

Answers may vary.

23) The main problem that occurs when humans are exposed to too much noise pollution is that the noise ____.

- ☐ **A)** interferes with conversations
- ☐ **B)** damages the inner ear
- ☐ **C)** vibrates the internal organs
- ☐ **D)** resonates inside the body

Correct Answer

B) damages the inner ear