GRADE 1–2 SCIENCE OLYMPIAD

Answers

1	B	Root
2	A	Sunlight, water and air
3	C	Platypus
4	D	To help them eat food
5	B	Ears
6	C	Heart
7	A	Milk
8	D	Water
9	B	Before eating and after using the toilet
10	D	Use a safe crossing and check for traffic with an adult
11	A	It evaporates into water vapour
12	C	Precipitation
13	B	Moving air
14	D	Blowing up a balloon
15	C	Thermometer
16	D	Go indoors and stay away from windows
17	D	Soil with a suitable mixture of particles and organic matter
18	B	Planting grass and other vegetation
19	A	Earth rotates on its axis
20	C	Earth's natural satellite
21	D	Clear glass
22	D	It melts into liquid water
23	C	A light source and an object that blocks light
24	B	Plucking a guitar string
25	A	It may start moving
26	D	Iron nail
27	C	A pond with suitable water conditions
28	B	Reusing materials and recycling suitable waste
29	D	Use similar plants, give them equal water and change only the light conditions
30	C	The cube in the warm room melts faster

GRADE 3–4 SCIENCE OLYMPIAD

Answers

1	A	It will stop receiving enough water and minerals from the soil.
2	B	Sugar and oxygen
3	C	Seed → seedling → adult plant → flowers and seeds
4	D	Insects
5	B	It keeps the bear warm in cold conditions.
6	C	Mouth
7	A	Your muscles need more oxygen and nutrients.
8	D	It may increase because fewer frogs eat it.
9	B	Pond A
10	C	Reuse supplies, avoid unnecessary packaging, and recycle suitable materials.
11	A	15 units in the direction of the pushes
12	D	Greater friction on the carpet slows the car down more.
13	B	Inclined plane
14	C	Light energy is converted into electrical energy.
15	A	Refraction
16	D	The sound becomes louder because the drum vibrates more strongly.
17	B	Metal transfers heat to your hand more readily than wood.
18	C	The magnetic attraction generally becomes weaker.
19	A	Connect the gap to make a complete circuit.
20	D	It spreads out to fill the available space.
21	B	Water vapour in the air cools and condenses into liquid.
22	C	It should be a poor conductor of heat.
23	A	Use a magnet to attract the iron filings.
24	D	Weather describes short-term conditions, while climate describes patterns over many years.
25	B	Use equal amounts of different soils, add equal amounts of water, and measure how much drains through.
26	C	The thick stem stores water, and the spines help reduce water loss.
27	A	It may increase because fewer snakes eat mice.
28	D	Ensure the blades can rotate freely around their axle.
29	B	It helps investigate the effect of light while keeping other conditions similar.
30	C	As the Moon orbits Earth, we see different portions of its sunlit half.

GRADE 5–6 SCIENCE OLYMPIAD

Answers

1	C	It is a plant cell that can carry out photosynthesis.
2	A	The supply of water to the stem and leaves
3	D	Amphibians
4	B	The muscles need more oxygen and glucose for respiration.
5	C	The grasshopper population increases.
6	C	48 cm^3
7	B	3 m/s
8	D	20 N
9	C	The carpet exerts greater opposing friction on the moving car.
10	A	Less force over a longer distance
11	D	Their temperature rises should be equal.
12	B	35°
13	C	String Y has a higher pitch.
14	A	They both go out.
15	D	Increasing the number of wire turns around the nail
16	C	15
17	B	It decreases.
18	C	Filter to collect sand, then evaporate the water
19	D	Iron reacts with oxygen and forms rust.
20	A	The solution is acidic.
21	C	Q is denser than P.
22	B	Deposition
23	D	Less coal needs to be burned, reducing carbon dioxide emissions from electricity generation.
24	A	Its axis is tilted as it orbits, changing sunlight angle and day length.
25	C	Use similar plants, change only fertiliser treatment, and keep other conditions the same.
26	B	3 m/s^2
27	D	125 kcal
28	A	Metal conducts heat away from your hand faster than wood.
29	C	4
30	D	Some dependent organisms may lose a food source, disrupting several food-web relationships.

GRADE 7–8 SCIENCE OLYMPIAD

Answers

1	B	4.0 g/cm³
2	B	3 m/s²
3	C	4 m/s²
4	D	3,000 Pa
5	A	60 W
6	C	Copper, because less energy is needed per degree of temperature rise
7	D	200 m/s
8	B	The light slows down as it enters glass.
9	B	2 A
10	C	Increasing the number of turns in the coil
11	A	Atomic number 17; mass number 35
12	D	36
13	B	X is more acidic than Y.
14	C	40 g/dm³
15	D	Iron displaces copper from the solution.
16	B	400×
17	C	Photosynthesis and glucose production
18	A	Small intestine
19	B	25%
20	C	Influenza is caused by a virus, and antibiotics target bacteria.
21	B	200 kJ
22	D	Mountain building or subduction, depending on the plates
23	A	Water vapour condenses into tiny droplets, potentially forming clouds.
24	D	1/16
25	B	Use similar plants, vary light intensity, control other variables, and measure growth repeatedly.
26	C	5 m/s and 0 m/s
27	D	44 g
28	A	The lower hole, because liquid pressure increases with depth
29	B	50%
30	C	Check for a possible error, repeat the measurement and report the data transparently.

GRADE 9–10 SCIENCE OLYMPIAD

Answers

1 **A** 24 m

2 **B** 200 W

3 **C** 4 m/s

4 **D** 400 J/(kg °C) is not possible because the temperature change is too small.

5 **A** 20 m/s

6 **B** 3 A

7 **D** Move the magnet more quickly through the coil.

8 **C** 23

9 **A** Strong electrostatic attractions between oppositely charged ions require substantial energy to overcome.

10 **D** 4 mol

11 **B** 4

12 **C** Copper oxide

13 **D** C_2H_4

14 **A** The powder has a greater total surface area exposed to the acid.

15 **B** Water enters by osmosis, making the cell turgid.

16 **D** 23

17 **C** 25%

18 **A** Resistant insects survive and reproduce more successfully.

19 **B** To increase delivery of oxygen and nutrients to active tissues.

20 **D** stimulates immune memory and a faster response to a later exposure.

21 **B** 500 kJ

22 **A** Carbon dioxide

23 **C** It reflects sunlight towards Earth.

24 **B** Temperature

25 **C** Investigate the unusual measurement and repeat the trial if possible.

26 **A** 3.0 g/cm³

27 **D** 600 J

28 **B** Filtration followed by distillation.

29 **C** High electrical conductivity and ductility.

30 **A** 1

GRADE 11–12 SCIENCE OLYMPIAD

Answers

1	A	70N	2	B	24J
3	C	2.0kg m^2	4	D	It becomes half as great.
5	A	$\omega^2 A$	6	B	1.50
7	C	4.0mm	8	D	15cm from the lens on the opposite side
9	A	It becomes four times its original value.	10	B*	2.0A
11	C	2.40dm^3	12	D	It lowers the activation energy without changing the overall enthalpy change.
13	A	It has seven valence electrons and commonly forms a 1- ion.	14	B	+1.10V
15	C	5	16	D	Increasing the pressure at constant temperature
17	A	Carboxylic acid	18	B	0.120mol dm^{-3}
19	C	Ammonia molecules donate lone pairs to the copper ion to form coordinate bonds.	20	D	The student has changed more than one independent variable, so the effect of temperature cannot be isolated.
21	A	Water leaves the cells by osmosis, causing the protoplasts to shrink.	22	C	41
23	D	Increased ventilation and cardiac output help increase oxygen uptake and delivery to tissues.	24	D	Resistant insects are more likely to survive and reproduce, increasing the frequency of resistance alleles.
25	A	The agent is a virus.	26	B	The genetic code is nearly universal, allowing bacteria to interpret many human gene codons in the same way.
27	C	Memory B and T cells help generate a faster, more effective secondary immune response.	28	D	Another factor, such as carbon dioxide concentration or temperature, has become limiting.
29	D	The amino acid sequence remains unchanged, although other effects on gene expression are possible.	30	D	Keep temperature, enzyme concentration, substrate concentration and reaction time consistent while changing pH.