General Science Practice

Use this key to check answers and read the explanations.

1. Two bar magnets have their north ends facing each other with a small gap between them. What force does each magnet exert on the other?

A. A repelling force
B. An attracting force
C. No force across the gap
D. A force only on the heavier magnet

Correct answer: A. A repelling force
The two facing poles are both north, so each magnet pushes the other away across the gap.

2. Which tiny extensions on many plant roots absorb water from the soil?

A. Flower stalks
B. Petals
C. Root hairs
D. Leaf buds

Correct answer: C. Root hairs
Root hairs extend the root’s outer surface into the soil and help the plant take up water.

3. A lamp above and to the left of an opaque toy is the only light near it. In which direction does the toy’s shadow stretch along the table?

A. To the left of the toy
B. To the right of the toy
C. Up toward the lamp
D. Equally in every direction

Correct answer: B. To the right of the toy
The toy blocks rays from the lamp. Its shadow lies on the side farther from the light, which is the right in this setup.

4. A shallow tray of water sits in sunshine. Its level falls even though the tray has no leak. Which change explains the falling level?

A. Some ice becomes liquid water.
B. Some water vapor becomes liquid water.
C. Some liquid water becomes ice.
D. Some liquid water becomes water vapor.

Correct answer: D. Some liquid water becomes water vapor.
Water can evaporate below its boiling point. Some molecules leave the liquid surface as water vapor.

5. Two pure tones travel through the same room. One sounds higher in pitch. Which wave property must be greater for the higher-pitched tone?

A. Wavelength
B. Frequency
C. Travel speed
D. Amplitude

Correct answer: B. Frequency
A higher pitch corresponds to more vibrations per second. In the same air, the higher-frequency tone has a shorter wavelength and travels at essentially the same speed.

6. The bowl of a solid metal spoon sits in warm water. Later the handle above the water warms too. What process carries thermal energy along the metal?

A. Conduction
B. Convection
C. Evaporation
D. Condensation

Correct answer: A. Conduction
Thermal energy moves through the solid metal from the warmer end toward the cooler handle by conduction.

7. A bee visits two flowers of the same species. Which part of its visit counts as pollination?

A. A petal on the first flower opens farther.
B. The bee drinks nectar on the first flower.
C. The bee lands briefly on the second flower's petal.
D. Pollen from the first flower lands on the second flower's stigma.

Correct answer: D. Pollen from the first flower lands on the second flower's stigma.
Pollination occurs when pollen reaches a flower's stigma. A bee can carry pollen from one flower to another as it visits them.

8. A fictional field report describes long parallel grooves on the exposed bedrock of a valley floor. Which process can create these features?

A. Minerals crystallized as water evaporated.
B. A pool of lava cooled into a layer of new rock.
C. A glacier dragged embedded stones over the bedrock.
D. Fine mud settled on the floor of a still lake.

Correct answer: C. A glacier dragged embedded stones over the bedrock.
Rock fragments caught beneath moving glacial ice can scrape parallel grooves, called striations, in the bedrock underneath.

9. In a backyard sky log, three stars keep the same pattern but appear to move together relative to a stationary roofline over several hours. What mainly explains the shift?

A. Earth rotates on its axis.
B. Earth moves a little closer to the stars in its orbit.
C. All three stars orbit Earth every day.
D. The three stars change their brightness together.

Correct answer: A. Earth rotates on its axis.
The roofline and observer turn with Earth. Earth's rotation changes the direction the stars appear to be in over the course of one night.

10. A class reports 3 m/s as model train A's average speed for a whole trip. A sensor reads 5 m/s for train B at a single instant. What can the class conclude?

A. Train B covered more total distance than train A.
B. Train B's trip average exceeded train A's by 2 m/s.
C. Train A stayed at or below 3 m/s throughout its trip.
D. Train B reached 5 m/s, but the two trip averages cannot yet be compared.

Correct answer: D. Train B reached 5 m/s, but the two trip averages cannot yet be compared.
An instantaneous reading gives the speed at one moment. Train B's total distance and elapsed time would give its average speed for comparison.

11. Block A has a mass of 24 g and a volume of 30 cm^3. Block B has a mass of 15 g and a volume of 12 cm^3. In a model with water density 1 g/cm^3 and no surface-tension effects, which blocks float?

A. Both blocks float.
B. Only block B floats.
C. Only block A floats.
D. Both blocks sink.

Correct answer: C. Only block A floats.
Divide each mass by its volume. A has density 0.80 g/cm^3, which is below water's density, so it floats. B has density 1.25 g/cm^3, so it sinks.

12. A fictional log records 15 chipmunk visits in 30 minutes at site A and 24 visits in 60 minutes at site B. Which comparison is supported by the records?

A. Site B had the higher observed rate, at 24 versus 15 visits per hour.
B. Site A had the higher observed rate, at 30 versus 24 visits per hour.
C. Both sites recorded 24 visits per hour.
D. Site B had 9 more individual chipmunks than site A.

Correct answer: B. Site A had the higher observed rate, at 30 versus 24 visits per hour.
Thirty minutes is half an hour, so site A's observed rate is 30 visits per hour. Site B recorded 24 visits in one hour. These rates count visits, and the same chipmunk could make more than one visit.

13. In a fictional record for one lunar day, coast A has highs of 2.0 and 2.0 m and lows of 0.5 and 0.5 m. Coast B has highs of 2.1 and 1.4 m and lows of 0.2 and 0.6 m. Which patterns do the records show?

A. Both are diurnal.
B. A is mixed semidiurnal and B is semidiurnal.
C. Both are semidiurnal.
D. A is semidiurnal and B is mixed semidiurnal.

Correct answer: D. A is semidiurnal and B is mixed semidiurnal.
Each coast has two highs and two lows. At A the two highs match and the two lows match, a semidiurnal pattern. At B the heights differ within both pairs, a mixed semidiurnal pattern.

14. A fictional brightness record dips on days 1.2, 4.7, and 8.2. Assume these are consecutive transits of one planet with a constant orbital period. On which day should the next dip occur?

A. Day 11.7
B. Day 9.4
C. Day 12.9
D. Day 15.2

Correct answer: A. Day 11.7
Both gaps between consecutive transits are 3.5 days. Adding another 3.5 days to day 8.2 predicts a transit on day 11.7.

15. A fictional light sensor reads 80 units at 1 m, 20 at 2 m, and 5 at 4 m. Model R predicts half the reading each time distance doubles. Model S predicts one quarter. Which model matches all three readings, and what does it predict at 8 m?

A. Model S, 2.5 units
B. Model R, 2.5 units
C. Model S, 1.25 units
D. Model R, 1.25 units

Correct answer: C. Model S, 1.25 units
Each doubling quarters the reading, from 80 to 20 to 5. Model S matches both changes and predicts 5 divided by 4, or 1.25 units, at 8 m.