

Practice Worksheet — Grade 6 Science

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Algorithms and abstraction

1. A program controlling a school greenhouse contains this instruction: if the temperature is above 28 degrees Celsius, open the vent. What kind of coding structure is this?
 - a) a loop, because the instruction repeats without ever stopping
 - b) an input, because the vent sends data back to the program
 - c) a conditional, because the action runs only when a test comes out true
 - d) an error, because the vent should simply be left open all the time
2. A robot is programmed to draw a regular hexagon by repeating this pair of steps six times: move forward 10 cm, then turn by the same angle each time. How many degrees must it turn at each corner?

Answer: _____ (degrees)

3. What does abstraction mean in computer science?
 - a) writing out every single step in as much detail as possible
 - b) removing instructions until the program is as short as it can be
 - c) hiding unnecessary detail so you can focus on what matters
 - d) drawing a diagram of a program instead of writing the code

Balanced and unbalanced forces

4. A steel cable holds a heavy sign hanging from a building, and a steel post beneath a balcony holds the balcony up from below. Which internal force is at work in each part?
 - a) both the cable and the post are in compression
 - b) the cable is in compression and the post is in tension
 - c) both the cable and the post are in tension
 - d) the cable is in tension and the post is in compression
5. The spring inside a kitchen scale is 12 cm long with an empty pan. Each 100 g mass placed in the pan stretches it a further 2 cm. How long is the spring when three 100 g masses sit in the pan, in centimetres?

Answer: _____ (cm)

6. Two forces act on a box in opposite directions, 10 N left and 10 N right. What happens?
 - a) the forces are balanced, so the motion does not change
 - b) the box lifts off the ground, because the two forces add together upward
 - c) the box speeds up to the right, because the rightward force acts last
 - d) the box speeds up to the left, because leftward forces always win out

Ecosystems and food chains

7. A wetland with many different plant and insect species is hit by a disease that wipes out one insect species. It carries on much as before. A nearby pond with only a few species is hit the same way and changes dramatically. What best explains the difference?
- a) species living in diverse ecosystems cannot catch diseases
 - b) the diverse wetland holds fewer organisms in total, so disease spreads more slowly there
 - c) in the more diverse wetland, other species were already doing similar jobs and could carry on
 - d) diverse ecosystems have no relationships between their species to disturb
8. A biologist counts 240 trout in a lake one summer. Five years later, after a stream feeding the lake is diverted, the count is 180 trout. By what percentage has the trout population fallen?

Answer: _____ (%)

9. In a food chain, what is a producer?
- a) an animal that eats plants and other producers
 - b) an organism that makes its own food using sunlight
 - c) an animal that hunts and eats other animals
 - d) an organism that breaks down dead plant material

Expansion and change of state

10. A block of ice with a mass of 250 g is left on a covered dish until it has completely melted. What is the mass of the water on the dish, in grams?

Answer: _____ (g)

11. What happens to the particles in a metal bar when it is heated?
- a) they vibrate faster and move slightly further apart
 - b) they stop moving once the metal has become hot
 - c) each particle grows larger, so the bar takes up more room
 - d) they turn into particles of an entirely different substance
12. Why are gaps left between sections of a bridge or railway line?
- a) to make the whole structure lighter so it needs less support underneath
 - b) to save on materials, since the gaps use less steel than solid track would
 - c) to let rainwater drain away instead of collecting on the surface
 - d) to give the material room to expand in hot weather

Greenhouse effect and climate change

13. Planting new forests and protecting existing ones is often listed as a way to slow climate change. Why does it help?
- a) trees give off oxygen, which pushes greenhouse gases out of the atmosphere
 - b) growing trees take carbon dioxide out of the air and lock that carbon into wood
 - c) trees shade the ground, and that shade is enough to cool the whole planet
 - d) trees soak up rainfall, which lowers the level of the oceans
14. What is the greenhouse effect?
- a) the Earth slowly moving closer to the Sun each year
 - b) sunlight being blocked on its way down by thick cloud
 - c) a hole in the atmosphere that lets extra heat in
 - d) gases in the atmosphere trap heat and keep Earth warm
15. Which human activities add greenhouse gases to the atmosphere? Select all that apply.
- a) cutting down large areas of forest
 - b) driving petrol vehicles
 - c) planting trees
 - d) burning coal and oil for electricity

Scientific explanations

16. A student notices that in her town both ice cream sales and cases of sunburn rise in July, and concludes that eating ice cream causes sunburn. What is the main problem with her explanation?
- a) two things rising together does not on its own show that one causes the other
 - b) she should have collected the figures for a full year instead of one month
 - c) ice cream sales figures do not count as data of any kind
 - d) sunburn cannot be measured, so no explanation about it is possible
17. What makes an explanation scientific?
- a) it is supported by evidence and can be tested
 - b) it has never been questioned by anybody who studied it
 - c) a great many people already believe that it is true
 - d) it sounds convincing when somebody explains it aloud
18. What is a hypothesis?
- a) the final conclusion of an experiment
 - b) a proven fact
 - c) a testable idea that suggests an explanation
 - d) a random guess with no reasoning

The solar system

19. A moving object keeps going in a straight line unless a force acts on it. What keeps each planet curving around the Sun instead of flying off into space?

- a) the solar wind blowing the planet sideways
- b) the Sun's gravity pulling on the planet
- c) the pull of the planet's nearest moon
- d) air in space pressing the planet inward

20. How many planets are there in our solar system?

Answer: _____ (planets)