

Science Workbook

White Belt — first facts and question drills

RiddleRaven

earn your shinies

book 01, 36 facts + 40 drills

For the parents

This book holds the first science facts a curious kid should own, the same ones the app teaches, plus drill questions from the RiddleRaven question bank.

Part 1 is the facts, asked as multiple choice. Read each one out loud together. Wrong answers here are good news: they show you exactly what to talk about at dinner.

Part 2 is drills. These change from book to book, so a new book means new questions on the same ideas.

The answer key explains every answer in kid language. Read the explanation even when the answer was right. That is where the learning compounds.

Contents

Part 1 — The facts 3

Part 2 — Drills 8

Answer key 14

Part 1 — The facts

1. What do your two lungs help you do?
 - A) Chew your food
 - B) Help you jump high
 - C) Hear music
 - D) Take in air so you can breathe
2. To open a door you push it or pull it. A push or a pull is called a what?
 - A) A flower
 - B) A force
 - C) A shadow
 - D) A song
3. Why is it dark at night?
 - A) Our side of the Earth is turned away from the Sun
 - B) The Sun breaks at night
 - C) Someone turns off the sky
 - D) The Sun falls asleep
4. Which sense would you use to find out if a bell is ringing?
 - A) Hearing
 - B) Taste
 - C) Smell
 - D) Touch
5. What are all things — you, water, air, and rocks — made of?
 - A) Magic dust
 - B) Matter
 - C) Music
 - D) Words
6. What do we often see glowing in the night sky, among the stars?
 - A) The Sun
 - B) A rainbow
 - C) The Moon
 - D) A cloud
7. You were once a tiny baby and now you are bigger. All living things do what over their lives?
 - A) Stay exactly the same
 - B) Turn into stones
 - C) Grow and change
 - D) Stop needing food
8. Before you let go of a ball, you say, 'It will fall down.' What do we call telling what you think will happen?
 - A) A joke
 - B) A nap
 - C) A prediction
 - D) A secret

9. The Sun and a lamp both let you see in the dark. What are they giving off?
- A) Light
 - B) Snow
 - C) Sound
 - D) Sugar
10. A baby kitten grows up to become a what?
- A) A cat
 - B) A dog
 - C) A bird
 - D) A fish
11. A scientist's very first job is to look and listen closely. What do we call paying careful attention to find out what is really there?
- A) Guessing wildly
 - B) Observing
 - C) Wishing hard
 - D) Napping
12. How is an animal different from a plant?
- A) Animals are always green
 - B) Animals can move around to find food
 - C) Animals never drink water
 - D) Animals grow in the soil
13. Ice, water, and steam are all the same stuff — water. What are these three forms called?
- A) Hot, warm, and cold
 - B) Big, small, and tiny
 - C) Red, blue, and green
 - D) Solid, liquid, and gas
14. You hold two rocks and notice one is big and one is small. Looking at how things are alike or different is called what?
- A) Sleeping
 - B) Comparing
 - C) Shouting
 - D) Hiding
15. You see the clouds turn dark and feel the wind pick up. Noticing these clues is called what?
- A) Making a wish
 - B) Telling a joke
 - C) Casting a spell
 - D) Making an observation
16. What do all living things — people, animals, and plants — need to stay alive?
- A) Toys and games
 - B) Food, water, and air
 - C) Gold and jewels
 - D) Nothing at all

17. What do your teeth help you do?
- A) See far away
 - B) Chew your food
 - C) Hear music
 - D) Grow taller
18. Which body part do you use to think, remember, and move?
- A) Your brain
 - B) Your elbow
 - C) Your heel
 - D) Your thumb
19. What happens to ice when it gets warm?
- A) It melts into liquid water
 - B) It turns to stone
 - C) It vanishes forever
 - D) It bursts into fire
20. A magnet can pull some things toward it. Which of these will a magnet stick to?
- A) A paper cup
 - B) An iron nail
 - C) A glass of water
 - D) A cotton sock
21. Your body has parts that each do a job. What does your heart do?
- A) Helps you see
 - B) Pumps blood all around your body
 - C) Grows your hair
 - D) Holds your lunch
22. When you use your eyes, ears, nose, tongue, and skin to find things out, what are you using?
- A) Your ten fingers
 - B) A pair of glasses
 - C) Your five senses
 - D) A magic spell
23. Which of these is a living thing?
- A) A spoon
 - B) A rock
 - C) A cloud
 - D) A dog
24. You blow into a balloon and it puffs up big. What is filling it?
- A) Sand
 - B) Water
 - C) Rocks
 - D) Air

25. All the bones inside you join together to make your what?
- A) A sandwich
 - B) A sweater
 - C) A skeleton
 - D) A shadow
26. Where can you find water on Earth?
- A) Only inside a cup
 - B) Only on the Moon
 - C) Nowhere at all
 - D) In rain, in rivers, and in the sea
27. Why can you hear a drum when someone hits it?
- A) It writes you a letter
 - B) It gives off a bright glow
 - C) It makes sound that travels through the air to your ears
 - D) It smells sweet
28. What do green plants need in order to grow?
- A) Sunlight and water
 - B) Cookies and milk
 - C) Darkness and cold
 - D) Loud music
29. Why is it good to wash your hands before you eat?
- A) To make them colder
 - B) To wash away tiny germs
 - C) To make them bigger
 - D) To turn them blue
30. A rock is hard and a pillow is soft. Words like hard and soft describe a thing's what?
- A) Its name
 - B) Its price
 - C) Its properties
 - D) Its age
31. Rain, snow, sunshine, and wind are all kinds of what?
- A) Kinds of food
 - B) Kinds of weather
 - C) Kinds of music
 - D) Kinds of animal
32. The four seasons are spring, summer, fall, and what?
- A) Winter
 - B) Monday
 - C) Purple
 - D) Breakfast

33. The tiniest building blocks that make up everything are called what?

- A) Acorns
- B) Ants
- C) Atoms
- D) Apples

34. Drop a ball and it falls to the ground. What pulls it down?

- A) The wind
- B) A magnet
- C) Your loud voice
- D) Gravity

35. What does the Sun give to the Earth?

- A) Rocks and sand
- B) Toys and books
- C) Rain and snow
- D) Light and heat

36. You stand in bright sunlight and see a dark shape on the ground. What blocks the light to make it?

- A) Your body
- B) A loud sound
- C) A sweet smell
- D) A cold wind

Part 2 — Drills

37. Mina places a drop of pond water on a slide. Most living things in it are too small to see with her eyes alone. Which tool would best let her examine them?
- A) a balance
 - B) a meterstick
 - C) a thermometer
 - D) a microscope
38. Where in an atom would you find the electrons?
- A) outside the atom entirely
 - B) in the nucleus
 - C) in shells around the nucleus
 - D) spread evenly through the whole atom
39. A tablet contains a medicinal component intended to produce its main effect, plus other materials that give the tablet shape and color. What is the medicinal component called?
- A) an inactive ingredient
 - B) the dosage form
 - C) the active ingredient
 - D) a breakdown product
40. Which force holds a boat up so it floats on the water?
- A) gravity
 - B) friction
 - C) tension
 - D) buoyancy
41. A microscope image contains 8 sensory receptors in each of 8 equal fields. How many receptors are counted?
- A) 64
 - B) 65
 - C) 66
 - D) 67
42. What causes day and night on Earth?
- A) Earth spinning on its axis
 - B) Earth orbiting the Sun once a year
 - C) the Moon covering the Sun
 - D) the Sun moving around the Earth
43. Which part of an atom carries a negative electric charge?
- A) electron
 - B) shell
 - C) neutron
 - D) nucleus

44. Which step of the water cycle turns liquid water into invisible water vapor?
- A) evaporation
 - B) precipitation
 - C) condensation
 - D) transpiration
45. Which of these is a FACT you could check (evidence), not just an opinion?
- A) That song is the most beautiful one ever written
 - B) Pizza tastes better than tacos
 - C) Nine of the twelve kids in class picked apples over pears
 - D) Blue is a much prettier colour than green
46. In genetics, which structure is a small unit of heredity that codes for one trait?
- A) gene
 - B) chromosome
 - C) enzyme
 - D) DNA
47. Which food group does an egg belong to?
- A) protein
 - B) dairy
 - C) vegetable
 - D) grains
48. Which force pulls all objects down toward the center of the Earth?
- A) tension
 - B) friction
 - C) gravity
 - D) magnetism
49. Which object is the natural satellite that circles the Earth?
- A) a comet
 - B) the Moon
 - C) Earth
 - D) an asteroid
50. Which daily habit best helps you keep your teeth free of cavities?
- A) drinking water
 - B) getting enough sleep
 - C) flossing your teeth
 - D) brushing your teeth
51. What kind of object is the Sun?
- A) an asteroid
 - B) a nebula
 - C) a star
 - D) a natural satellite

52. Researchers measure how much of a medicine is given instead of assuming that the largest amount will work best. Why does the amount matter?
- A) A larger amount always removes every possible side effect.
 - B) Every amount produces exactly the same effect in the body.
 - C) It must provide benefit while limiting the chance of harm.
 - D) The amount changes only the color of the medicine.
53. Tears flow across the eyes and contain substances that can harm some microbes. How do tears help protect the eyes?
- A) They form a blood clot around each microbe on the eye.
 - B) They engulf microbes in the same way that phagocytes do.
 - C) They activate cytotoxic T cells inside the tear fluid.
 - D) They rinse away microbes and can damage some of them.
54. Which animal group has an animal with feathers and a beak?
- A) insects
 - B) amphibians
 - C) reptiles
 - D) birds
55. Which word means "how fast an object moves"?
- A) force
 - B) speed
 - C) momentum
 - D) gravity
56. A field team collects 16 ash samples from each of 6 sites. How many samples are collected?
- A) 93
 - B) 94
 - C) 95
 - D) 96
57. Green plants use energy from the Sun to make their own food. What is this food-making process called?
- A) pollination
 - B) photosynthesis
 - C) germination
 - D) evaporation
58. Which state of matter always keeps its own fixed shape and size?
- A) solid
 - B) gas
 - C) plasma
 - D) liquid

59. An animal cannot make its own food, so it must eat other living things to get energy. What do we call an organism that eats other organisms?
- A) a decomposer
 - B) a consumer
 - C) a predator
 - D) a pollinator
60. A force is acting here: a soft blob of dough is pressed down. What does the force do?
- A) changes its shape
 - B) makes it stop
 - C) makes it speed up
 - D) changes its direction
61. A cloud moves 16 meters each minute for 5 minutes at a steady speed. How many meters does it move?
- A) 79
 - B) 80
 - C) 81
 - D) 82
62. What is the correct term for the branch of science that studies how features are passed on?
- A) adaptation
 - B) heredity
 - C) variation
 - D) genetics
63. Which organ pumps blood to every part of the body?
- A) the heart
 - B) the liver
 - C) the skin
 - D) the bones
64. Most microbes on a clean, unbroken hand never enter the tissues beneath it. Which body feature is acting as the first defense?
- A) the intact skin barrier
 - B) the blood carrying oxygen
 - C) the muscles that move the hand
 - D) the bones inside the fingers
65. A tiny pond organism is made of just one living unit. It takes in nutrients, grows, responds to light, and reproduces. What does this observation show?
- A) The organism cannot be alive because every organism must have tissues.
 - B) The living unit must be a piece broken from a multicellular organism.
 - C) One cell can perform all the life functions that this organism needs.
 - D) One cell can grow and respond but must use a different cell to reproduce.

66. A scientist writes this line in a lab notebook: The liquid turned bright blue. Is the line something directly noticed, or a guess about what it means?
- A) a hypothesis
 - B) an inference
 - C) an observation
 - D) a prediction
67. Each of 7 equal blood samples carries 17 measured oxygen units. How many units are carried altogether?
- A) 116
 - B) 117
 - C) 118
 - D) 119
68. Which part of a plant holds the plant up and carries water inside it?
- A) seed
 - B) bark
 - C) roots
 - D) stem
69. A plant produces 11 milligrams of sugar each hour in steady light for 6 hours. How many milligrams are produced?
- A) 65
 - B) 66
 - C) 67
 - D) 68
70. A team measures 6 temperature readings during each of 3 insulation trials. How many readings are collected?
- A) 16
 - B) 17
 - C) 18
 - D) 19
71. Which body part does your thinking and controls your body?
- A) kidney
 - B) brain
 - C) lungs
 - D) stomach
72. A student looks at a very thin piece of onion skin through a microscope and sees many tiny, boxlike living units. What are these units?
- A) organs
 - B) tissues
 - C) cells
 - D) organ systems

73. Which body system moves blood, oxygen, and nutrients around the body?
- A) the immune system
 - B) the respiratory system
 - C) the circulatory system
 - D) the nervous system
74. What is the chemical symbol for carbon?
- A) Na
 - B) C
 - C) N
 - D) O
75. Which motion makes the Sun appear to rise and set as our planet spins once each day?
- A) the Sun's rotation
 - B) Earth's orbit
 - C) the tides
 - D) Earth's rotation
76. At room temperature, which state of matter is the drink in a cup?
- A) solid
 - B) liquid
 - C) gas
 - D) plasma

Answer key — book 01

1. D) Take in air so you can breathe

You have two lungs. They take in air so your body gets the oxygen it needs to live.

2. B) A force

A force is a push or a pull. Forces can make things move, stop, or change direction.

3. A) Our side of the Earth is turned away from the Sun

The Earth spins. When your side turns away from the Sun it is night; when it faces the Sun it is day.

4. A) Hearing

You hear sounds with your ears — one of your five senses.

5. B) Matter

Everything you can touch is made of matter. Tiny bits called atoms build all matter.

6. C) The Moon

The Moon circles the Earth. It shines by reflecting light from the Sun.

7. C) Grow and change

All living things grow and change as they get older — that is part of being alive.

8. C) A prediction

A prediction is your best guess about what will happen next, using what you already know.

9. A) Light

Light lets us see. It comes from the Sun, from fire, and from lamps.

10. A) A cat

Baby animals grow up to look like their parents. A kitten becomes a cat.

11. B) Observing

Observing means using your senses to notice carefully — it is the first science skill.

12. B) Animals can move around to find food

Most animals move around to find food; plants stay put and make their own food from sunlight.

13. D) Solid, liquid, and gas

Matter comes in three everyday states: solid (ice), liquid (water), and gas (steam).

14. B) Comparing

Comparing means noticing how things are alike and how they are different — a useful science skill.

15. D) Making an observation

An observation is something you notice with your senses that can be a clue about what will happen.

16. B) Food, water, and air

Every living thing needs food, water, and air to live and grow.

17. B) Chew your food

Your teeth bite and chew food into small pieces so your body can swallow and use it.

18. A) Your brain

Your brain lets you think, remember, and move your body. It is the boss of you.

19. A) It melts into liquid water

Warming makes ice melt into water; more heat turns water into steam. Cooling changes it back again.

20. B) An iron nail

Magnets pull on iron and steel. They do not pull on paper, glass, water, or cloth.

21. B) Pumps blood all around your body

The heart is a muscle that pumps blood, carrying food and air to every part of you.

22. C) Your five senses

Your five senses — sight, hearing, smell, taste, and touch — are how you notice the world.

23. D) A dog

Living things grow, need food and water, and can have babies. A dog is alive; a rock is not.

24. D) Air

Air is a gas. You cannot see it, but it is real stuff that takes up space and fills the balloon.

25. C) A skeleton

Your bones join into a skeleton that holds you up and protects the soft parts inside you.

26. D) In rain, in rivers, and in the sea

Water is all around us — falling as rain, flowing in rivers, and filling the great oceans.

27. C) It makes sound that travels through the air to your ears

A drum shakes the air and makes sound. The sound travels through the air to your ears so you can hear it.

28. A) Sunlight and water

Plants make their own food using sunlight, water, and air. That is why they grow toward the light.

29. B) To wash away tiny germs

Germs are too small to see and can make you sick. Washing with soap and water rinses them away.

30. C) Its properties

Properties are what something is like — hard or soft, heavy or light — the ways we describe matter.

31. B) Kinds of weather

Weather is what the sky and air are doing outside — sunny, rainy, windy, or snowy.

32. A) Winter

As the year goes around, the weather changes through spring, summer, fall, and winter.

33. C) Atoms

Atoms are far too small to see, but they join together to build every bit of matter.

34. D) Gravity

Gravity is the force that pulls everything toward the Earth. It is why things fall down, not up.

35. D) Light and heat

The Sun is a star. Its light and heat warm the Earth and help plants grow.

36. A) Your body

A shadow forms when something blocks the light. Your body blocks the sunlight and makes a shadow.

37. D) a microscope

A microscope magnifies objects that are too small to examine with unaided eyes.

38. C) in shells around the nucleus

Protons and neutrons sit together in the tiny central nucleus. Electrons move in shells (energy levels) around it.

39. C) the active ingredient

The active ingredient is the substance intended to produce the medicine's effect. Other ingredients can help form, preserve, or deliver it.

40. D) buoyancy

Gravity pulls things down, friction slows sliding surfaces, magnetism pulls certain metals, and buoyancy holds floating things up.

41. A) 64

Eight fields times 8 receptors equals 64.

42. A) Earth spinning on its axis

Earth spins once about every 24 hours. The side facing the Sun has day; the side turned away has night. The Sun does not move around us.

43. A) electron

Protons are positive, electrons are negative, and neutrons are neutral. The nucleus and shells are places, not charged particles.

44. A) evaporation

Evaporation lifts water into the air as vapor, condensation cools it back into cloud droplets, and precipitation drops it as rain or snow.

45. C) Nine of the twelve kids in class picked apples over pears

Evidence is something you can measure or count, like a time or a height. The other choices are opinions — feelings that different people can disagree about, with no measurement to settle them.

46. A) gene

DNA is the twisted-ladder molecule of heredity; a gene is a short piece of DNA that codes for one trait; a chromosome is coiled-up DNA carrying many genes.

47. A) protein

The five everyday food groups are fruit, vegetable, grains, protein, and dairy. A balanced meal borrows from several of them.

48. C) gravity

Gravity is the force that pulls objects toward the center of the Earth, which is why dropped things fall down.

49. B) the Moon

The Sun is our star at the center of the solar system, the Moon orbits Earth, Earth is our home planet, and a galaxy is an enormous group of stars.

50. D) brushing your teeth

Simple daily habits protect your health: wash hands to remove germs, sleep to rest, exercise to stay fit, and brush to protect teeth.

51. C) a star

The Sun is a star, the Earth is a planet, the Moon is a natural satellite, and the Milky Way is a galaxy.

52. C) It must provide benefit while limiting the chance of harm.

A useful dose aims for the intended effect while staying within a range where harmful effects are acceptably limited.

53. D) They rinse away microbes and can damage some of them.

Tears provide both a mechanical defense by washing the surface and a chemical defense through antimicrobial substances.

54. D) birds

Birds have feathers, fish have gills, mammals have fur and feed milk, amphibians live part in water and part on land, and reptiles have dry scales.

55. B) speed

Speed is how fast; a force is a push or pull; gravity pulls objects toward Earth; friction is the rubbing that slows sliding.

56. D) 96

Six sites with 16 samples each produce 96 samples.

57. B) photosynthesis

Photosynthesis is how green plants turn sunlight, water, and carbon dioxide into sugar for food. That is why plants are called producers.

58. A) solid

Solid = fixed shape, liquid = flows but fixed volume, gas = fills its container, plasma = a hot charged state found in stars and lightning.

59. B) a consumer

Producers make their own food, but consumers must eat other living things. Animals are consumers.

60. A) changes its shape

A force can start motion, stop motion, change direction, or change an object's shape.

61. B) 80

Distance is rate times time: 16 times 5 equals 80 meters.

62. D) genetics

A trait is an inherited feature; heredity is the passing of traits to offspring; genetics is the science that studies inheritance.

63. A) the heart

Each organ has one main job. The heart pumps blood, the lungs take in air, the stomach breaks down food, and the brain runs the body's messages.

64. A) the intact skin barrier

Unbroken skin forms a physical barrier that keeps many microbes outside the body.

65. C) One cell can perform all the life functions that this organism needs.

A single-celled organism has no organs, yet its one cell carries out the processes needed for life.

66. C) an observation

An observation is what you directly see, hear, count, or measure. An inference is a careful guess about WHY. Good scientists write down what they observe first, then infer.

67. D) 119

Seven samples times 17 units equals 119.

68. D) stem

Roots drink up water and anchor the plant, leaves make food in sunlight, the stem holds the plant up and moves water, and the flower makes seeds.

69. B) 66

Production is rate times time: 11 times 6 equals 66.

70. C) 18

Three trials with 6 readings each make 18.

71. B) brain

The heart pumps blood, the lungs take in air, the brain thinks and controls the body, and the stomach breaks down food.

72. C) cells

Cells are the smallest living units of an onion. A tissue is a group of cells, an organ contains multiple tissues, and organ systems contain organs.

73. C) the circulatory system

Body systems are teams of organs. Circulation moves blood, respiration exchanges gases, digestion pulls nutrients from food, and the nervous system signals the rest.

74. B) C

Each element has a one- or two-letter symbol. The first letter is always capitalized; a second letter is lower-case.

75. D) Earth's rotation

Earth's rotation (spinning on its axis) gives us day and night; Earth's orbit around the Sun takes one year.

76. B) liquid

Solids keep their shape, liquids flow and take the shape of their container, and gases spread out to fill all the space they can.