Vertex Academy

Year 5 Science workbook

9 worksheets · answers at the back

Contents

1. Mass, volume and density: why things float or sink
2. Heat: where thermal energy comes from and where it goes
3. Weight, friction, and air and water resistance
4. Earth's tilt, the seasons, Matariki and Puanga
5. Sorting living things: plants, animals and keys
6. Fungi, bacteria, species and scientific names
7. Digestion, part 1: from your mouth to your small intestine
8. Digestion, part 2: absorbing nutrients and getting rid of waste
9. Food webs: who eats what in a New Zealand forest

Year 5 Science: Mass, volume and density: why things float or sink

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Water in a measuring cylinder is at 40 mL. A toy dinosaur is dropped in and sinks, and the water rises to 52 mL. What is the volume of the toy?

2. A block of wood has a mass of 80 g and a volume of 100 mL. Work out its density. Will it float or sink in water?

3. Which unit would you use for the water in a school swimming pool: millilitres, grams, kilograms or cubic metres?

4. Two balls are exactly the same size. One has a mass of 20 g and the other has a mass of 200 g. Which ball is denser?

5. Ana reads a measuring cylinder from above and writes 47 mL. Her teacher reads it with her eye level with the water and gets 45 mL. Whose reading is better, and why?

Fix the mistake

6. Correct this statement: "Heavy things sink and light things float."

7. Correct this statement: "Density is volume divided by mass."

8. Correct this statement: "Read the measuring cylinder at the top of the curved water edge, looking down."

9. Correct this statement: "Mass and volume are the same thing, because bigger things weigh more."

Year 5 Science: Heat: where thermal energy comes from and where it goes

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. You rub your hands together quickly and they get warm. What is the source of the thermal energy?

2. A cold can of drink sits on a table in a room at 22 °C. Which way does thermal energy move?

3. A bowl of soup at 60 °C is left on the bench in a room at 20 °C. What temperature will it end up at?

4. Which of these is a testable question: "Is summer the best season?" or "Does a lid change how fast hot water cools?"

5. Mia tests ice melting on two trays. She uses a big ice cube on the metal tray and a small one on the plastic tray. What is wrong with her test?

Fix the mistake

6. Correct this statement: "When I hold ice, the cold moves into my hand."

7. Correct this statement: "A jumper makes heat, so it warms you up."

8. Correct this statement: "A hot drink keeps cooling until it is colder than the room."

9. Correct this statement: "Using a big ice cube on one tray and a small one on another is still a fair test."

Year 5 Science: Weight, friction, and air and water resistance

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Why is it harder to push a full supermarket trolley than an empty one?

2. A toy car is rolled onto ice, lino and carpet. On which surface will friction stop it soonest?

3. Group A's three results were 40 cm, 42 cm and 41 cm. Group B's were 20 cm, 55 cm and 38 cm. Which group controlled its variables better?

4. What force slows down a swimmer moving through the pool?

5. Why do mountain bike tyres have big knobbly treads?

Fix the mistake

6. Correct this statement: "A rolling ball stops because it runs out of force."

7. Correct this statement: "Mass and weight are the same thing."

8. Correct this statement: "Smooth surfaces have no friction at all."

9. Correct this statement: "Air does not push on anything, because you cannot see it."

Year 5 Science: Earth's tilt, the seasons, Matariki and Puanga

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. About how many degrees is Earth's axis tilted?

2. In December, does the Southern Hemisphere lean towards the Sun or away from it?

3. Use the Auckland table. Which month had the shortest day, and how long was it?

4. A torch beam shines straight down on the floor, then at a slant. Why does the slanted beam warm each part of the floor less?

5. In which season does Matariki appear in the dawn sky in New Zealand?

Fix the mistake

6. Correct this statement: "It is summer because Earth is closer to the Sun."

7. Correct this statement: "Earth's axis swings round so it always leans towards the Sun."

8. Correct this statement: "Summer is warm only because the days are longer."

9. Correct this statement: "Matariki is a single star."

Year 5 Science: Sorting living things: plants, animals and keys

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A kauri makes seeds in cones and has no flowers. Which plant group is it in?

2. A tuatara has a backbone. Is it a vertebrate or an invertebrate?

3. Why is kelp not classified as a plant?

4. An animal has eight legs, two body parts and no backbone. Is it an insect or a spider?

5. Which of these can only be seen with a microscope: a bacterium, a moss or an ant?

Fix the mistake

6. Correct this statement: "Seaweed is a plant because it is green and lives in water."

7. Correct this statement: "Plants that live in water all go in the same group."

8. Correct this statement: "A spider is an insect."

9. Correct this statement: "A key question can be "Is it big?""

Year 5 Science: Fungi, bacteria, species and scientific names

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Is yeast a plant, an animal or a fungus?

2. The bacteria that turn milk into yoghurt: are they helpful, neutral or harmful to us?

3. In the scientific name Homo sapiens, which word is the genus, and which word starts with a capital letter?

4. A horse and a donkey have a mule, and the mule cannot have young. Are horses and donkeys the same species?

5. Are Apteryx mantelli and Apteryx owenii close relatives? How can you tell?

Fix the mistake

6. Correct this statement: "Mushrooms are plants because they grow out of the ground."

7. Correct this statement: "All bacteria are germs that make you sick."

8. Correct this statement: "The human scientific name is written homo Sapiens."

9. Correct this statement: "Any two animals that can have a baby together are the same species."

Year 5 Science: Digestion, part 1: from your mouth to your small intestine

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Which teeth grind food at the back of your mouth?

2. Is chewing mechanical digestion or chemical digestion?

3. What does the enzyme in saliva change starch into?

4. What is the name of the tube that carries food from your mouth to your stomach?

5. Give two jobs of the acid in your stomach.

Fix the mistake

6. Correct this statement: "Digestion starts in the stomach."

7. Correct this statement: "Food falls down the oesophagus because of gravity."

8. Correct this statement: "Enzymes are tiny living things, like germs."

9. Correct this statement: "The small intestine is short, because it is called small."

Year 5 Science: Digestion, part 2: absorbing nutrients and getting rid of waste

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. In which part of the digestive system are most nutrients absorbed?

2. What is the job of the villi?

3. What is the main job of the large intestine?

4. Give one way that helpful bacteria in your gut help you.

5. Where is waste stored before it leaves the body?

Fix the mistake

6. Correct this statement: "Food goes straight from the stomach into the blood."

7. Correct this statement: "All the bacteria in your gut are harmful germs."

8. Correct this statement: "The large intestine is longer than the small intestine."

9. Correct this statement: "The large intestine absorbs most of the nutrients."

Year 5 Science: Food webs: who eats what in a New Zealand forest

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. In the food chain "grass → snail → song thrush", which organism is the producer?

2. A rat eats seeds and wētā. Is it a herbivore, a carnivore or an omnivore?

3. Which way does the arrow point between a wētā and the ruru that eats it?

4. Why is one food chain not enough to show the feeding links in a forest?

5. In Room 3's garden, spiders eat flies. Predict what would happen to the number of flies if the spiders disappeared.

Fix the mistake

6. Correct this statement: "In a food chain the arrow points to the thing that gets eaten: ruru → wētā."

7. Correct this statement: "Plants get their food from the soil."

8. Correct this statement: "One food chain shows everything that happens in a habitat."

9. Correct this statement: "Removing one animal from a food web only affects the animal that ate it."

Answer key (for parents and tutors)

1. Water in a measuring cylinder is at 40 mL. A toy dinosaur is dropped in and sinks, and the water rises to 52 mL. What is the volume of the toy?
   12 mL, because 52 − 40 = 12.
2. A block of wood has a mass of 80 g and a volume of 100 mL. Work out its density. Will it float or sink in water?
   80 ÷ 100 = 0.8 g/mL. That is less than water's 1 g/mL, so it floats.
3. Which unit would you use for the water in a school swimming pool: millilitres, grams, kilograms or cubic metres?
   Cubic metres (m^3), because a pool holds a very large volume. Grams and kilograms measure mass, not volume.
4. Two balls are exactly the same size. One has a mass of 20 g and the other has a mass of 200 g. Which ball is denser?
   The 200 g ball, because it packs more mass into the same volume.
5. Ana reads a measuring cylinder from above and writes 47 mL. Her teacher reads it with her eye level with the water and gets 45 mL. Whose reading is better, and why?
   The teacher's, because you read at eye level at the bottom of the curve. Looking from above makes the reading too high.
6. Correct this statement: "Heavy things sink and light things float."
   Density decides it, not mass: a huge log floats because wood is less dense than water, while a tiny coin sinks.
7. Correct this statement: "Density is volume divided by mass."
   Density is mass divided by volume, so 39 g in 15 mL is 39 ÷ 15 = 2.6 g/mL.
8. Correct this statement: "Read the measuring cylinder at the top of the curved water edge, looking down."
   Read at the bottom of the curve with your eye level with the water, or the reading comes out too high.
9. Correct this statement: "Mass and volume are the same thing, because bigger things weigh more."
   Mass is how much matter there is and volume is how much space it fills; a bag of popcorn is big but light.

Answer key (for parents and tutors)

1. You rub your hands together quickly and they get warm. What is the source of the thermal energy?
   Friction, from rubbing the two surfaces together.
2. A cold can of drink sits on a table in a room at 22 °C. Which way does thermal energy move?
   From the warmer air and table into the cold can, so the can warms up.
3. A bowl of soup at 60 °C is left on the bench in a room at 20 °C. What temperature will it end up at?
   It cools to 20 °C, room temperature, then stops cooling.
4. Which of these is a testable question: "Is summer the best season?" or "Does a lid change how fast hot water cools?"
   "Does a lid change how fast hot water cools?", because you can change one thing (lid or no lid) and measure the temperature.
5. Mia tests ice melting on two trays. She uses a big ice cube on the metal tray and a small one on the plastic tray. What is wrong with her test?
   It is not a fair test: the ice cube size should be the same, so only the tray material changes.
6. Correct this statement: "When I hold ice, the cold moves into my hand."
   Thermal energy moves out of your warmer hand into the ice; your hand feels cold because it is losing energy.
7. Correct this statement: "A jumper makes heat, so it warms you up."
   A jumper makes no thermal energy; it slows the energy leaving your body, so you stay warm.
8. Correct this statement: "A hot drink keeps cooling until it is colder than the room."
   It stops cooling once it reaches room temperature, because then nothing around it is cooler.
9. Correct this statement: "Using a big ice cube on one tray and a small one on another is still a fair test."
   The ice cube size is a variable too, so it must be the same on every tray or you cannot compare the trays.

Answer key (for parents and tutors)

1. Why is it harder to push a full supermarket trolley than an empty one?
   The full trolley has more mass, so it needs a bigger force to change its speed.
2. A toy car is rolled onto ice, lino and carpet. On which surface will friction stop it soonest?
   Carpet, because its rough surface gives the most friction.
3. Group A's three results were 40 cm, 42 cm and 41 cm. Group B's were 20 cm, 55 cm and 38 cm. Which group controlled its variables better?
   Group A, because its results are close together; Group B's spread from 20 cm to 55 cm, so something was not kept the same.
4. What force slows down a swimmer moving through the pool?
   Water resistance, the push of the water against the swimmer.
5. Why do mountain bike tyres have big knobbly treads?
   The knobbly treads increase friction, so the tyres grip on mud and loose dirt.
6. Correct this statement: "A rolling ball stops because it runs out of force."
   It stops because friction and air resistance push against its motion; without them it would keep rolling.
7. Correct this statement: "Mass and weight are the same thing."
   Mass is how much matter there is, in kg; weight is the pull of gravity on that mass.
8. Correct this statement: "Smooth surfaces have no friction at all."
   Smooth surfaces still have tiny bumps, so there is some friction, just less than on rough surfaces.
9. Correct this statement: "Air does not push on anything, because you cannot see it."
   Air is a fluid, and it pushes against anything moving through it; that push is air resistance.

Answer key (for parents and tutors)

1. About how many degrees is Earth's axis tilted?
   About 23.5 degrees.
2. In December, does the Southern Hemisphere lean towards the Sun or away from it?
   Towards the Sun, which is why December is summer in New Zealand.
3. Use the Auckland table. Which month had the shortest day, and how long was it?
   June, with 9 h 38 min of daylight.
4. A torch beam shines straight down on the floor, then at a slant. Why does the slanted beam warm each part of the floor less?
   The same light is spread over a bigger area, so each part gets less energy.
5. In which season does Matariki appear in the dawn sky in New Zealand?
   Midwinter, around June or July.
6. Correct this statement: "It is summer because Earth is closer to the Sun."
   Seasons come from the tilt; when it is summer in New Zealand it is winter in the Northern Hemisphere, at the same distance from the Sun.
7. Correct this statement: "Earth's axis swings round so it always leans towards the Sun."
   The axis keeps leaning the same way in space, so each hemisphere leans towards the Sun for part of the year and away for the rest.
8. Correct this statement: "Summer is warm only because the days are longer."
   Long days help, but the high midday sun matters too, because straight-on sunlight packs more energy into each patch of ground.
9. Correct this statement: "Matariki is a single star."
   Matariki is a cluster of many stars; Puanga is the single star Rigel.

Answer key (for parents and tutors)

1. A kauri makes seeds in cones and has no flowers. Which plant group is it in?
   Cone-bearing plants.
2. A tuatara has a backbone. Is it a vertebrate or an invertebrate?
   A vertebrate (it is a reptile).
3. Why is kelp not classified as a plant?
   It has no true roots, stems or leaves, so it is an alga, not a plant.
4. An animal has eight legs, two body parts and no backbone. Is it an insect or a spider?
   A spider, because insects have six legs and three body parts.
5. Which of these can only be seen with a microscope: a bacterium, a moss or an ant?
   A bacterium, because it is a microorganism.
6. Correct this statement: "Seaweed is a plant because it is green and lives in water."
   Seaweed is an alga: it has no true roots, stems or leaves, so it is in a separate group from plants.
7. Correct this statement: "Plants that live in water all go in the same group."
   Plants are grouped by their structures, not where they live; seagrass has flowers, so it is a flowering plant.
8. Correct this statement: "A spider is an insect."
   Spiders have eight legs and two body parts; insects have six legs and three body parts, so they are different groups.
9. Correct this statement: "A key question can be "Is it big?""
   Use features anyone can check the same way, such as "Does it have a shell?", because big means different things to different people.

Answer key (for parents and tutors)

1. Is yeast a plant, an animal or a fungus?
   A fungus.
2. The bacteria that turn milk into yoghurt: are they helpful, neutral or harmful to us?
   Helpful.
3. In the scientific name Homo sapiens, which word is the genus, and which word starts with a capital letter?
   Homo is the genus, and it is the word with the capital letter; sapiens is all lower case.
4. A horse and a donkey have a mule, and the mule cannot have young. Are horses and donkeys the same species?
   No. The young of one species must be able to have young of their own, and mules cannot.
5. Are Apteryx mantelli and Apteryx owenii close relatives? How can you tell?
   Yes, because they share the same genus name, Apteryx.
6. Correct this statement: "Mushrooms are plants because they grow out of the ground."
   Mushrooms are fungi: they cannot make food from sunlight, so they feed by growing into and soaking up their food.
7. Correct this statement: "All bacteria are germs that make you sick."
   Only some bacteria are harmful; many are harmless, and some, like those in yoghurt and your gut, are helpful.
8. Correct this statement: "The human scientific name is written homo Sapiens."
   The genus has the capital and the species part is lower case: Homo sapiens, in italics.
9. Correct this statement: "Any two animals that can have a baby together are the same species."
   Their young must also be able to have young; a horse and a donkey make a mule, which almost never can.

Answer key (for parents and tutors)

1. Which teeth grind food at the back of your mouth?
   Molars.
2. Is chewing mechanical digestion or chemical digestion?
   Mechanical digestion, because it only breaks food into smaller pieces.
3. What does the enzyme in saliva change starch into?
   Sugar.
4. What is the name of the tube that carries food from your mouth to your stomach?
   The oesophagus.
5. Give two jobs of the acid in your stomach.
   It kills many germs in the food, and it helps an enzyme break down proteins.
6. Correct this statement: "Digestion starts in the stomach."
   Digestion starts in the mouth, where teeth break food up and saliva starts changing starch into sugar.
7. Correct this statement: "Food falls down the oesophagus because of gravity."
   Muscles in the oesophagus squeeze food along in waves, which is why you can swallow lying down.
8. Correct this statement: "Enzymes are tiny living things, like germs."
   Enzymes are chemicals made by your body; they are not alive and are not used up.
9. Correct this statement: "The small intestine is short, because it is called small."
   It is called small because it is narrow; it is actually the longest part of the digestive system.

Answer key (for parents and tutors)

1. In which part of the digestive system are most nutrients absorbed?
   The small intestine.
2. What is the job of the villi?
   They give the small intestine a huge surface, so nutrients can pass quickly into the blood.
3. What is the main job of the large intestine?
   To absorb water back into the body.
4. Give one way that helpful bacteria in your gut help you.
   They break down some fibre that your enzymes cannot (they also make some vitamins and help keep harmful germs out).
5. Where is waste stored before it leaves the body?
   In the rectum, until it leaves through the anus.
6. Correct this statement: "Food goes straight from the stomach into the blood."
   Most nutrients are absorbed through the villi of the small intestine, after the food has been fully broken down.
7. Correct this statement: "All the bacteria in your gut are harmful germs."
   Many gut bacteria are helpful: they break down some fibre, make some vitamins and help keep harmful germs out.
8. Correct this statement: "The large intestine is longer than the small intestine."
   The large intestine is wider but much shorter; the small intestine is the longest part.
9. Correct this statement: "The large intestine absorbs most of the nutrients."
   The small intestine absorbs most nutrients; the large intestine's main job is taking back water.

Answer key (for parents and tutors)

1. In the food chain "grass → snail → song thrush", which organism is the producer?
   The grass, because it makes its own food.
2. A rat eats seeds and wētā. Is it a herbivore, a carnivore or an omnivore?
   An omnivore, because it eats both plants and animals.
3. Which way does the arrow point between a wētā and the ruru that eats it?
   From the wētā to the ruru (wētā → ruru), the way the food moves.
4. Why is one food chain not enough to show the feeding links in a forest?
   Most animals eat more than one thing and are eaten by more than one thing, so the chains join into a web.
5. In Room 3's garden, spiders eat flies. Predict what would happen to the number of flies if the spiders disappeared.
   The number of flies would probably go up, because fewer flies would be eaten.
6. Correct this statement: "In a food chain the arrow points to the thing that gets eaten: ruru → wētā."
   The arrow points to the eater, the way the food moves: wētā → ruru.
7. Correct this statement: "Plants get their food from the soil."
   Plants make their own food using light; they only take water and minerals from the soil.
8. Correct this statement: "One food chain shows everything that happens in a habitat."
   Most animals eat several things and are eaten by several, so you need a food web to show all the links.
9. Correct this statement: "Removing one animal from a food web only affects the animal that ate it."
   The change spreads through the web: its food can increase and its predators may switch to other prey.