Vertex Academy

Year 6 Science workbook

8 worksheets · answers at the back

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Year 6 Science: Chemical change: new substances and the signs to look for

Name: _____ Date: _____

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

Practice

1. Is melting butter for a cake a chemical change or a physical change?

2. A steel nail left outside turns orange and flaky. What clue is this, and what kind of change is it?

3. In the reaction wood + oxygen → ash + smoke + carbon dioxide, what are the reactants?

4. Why can a cake never be turned back into batter?

5. Name a chemical change that happens inside your own body.

Fix the mistake

6. Correct this statement: "Ice melting is a chemical change because it looks different."

7. Correct this statement: "Any bubbles mean a chemical change."

8. Correct this statement: "The products are the things you mix together at the start."

9. Correct this statement: "Salt dissolving in water makes a new substance, because the salt disappears."

Year 6 Science: Simple circuits: loops, switches and circuit diagrams

Name: _____ Date: _____

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

Practice

1. A lamp will not light because one wire has come loose. Is the circuit open or closed?

2. Which of these would close the gap in a circuit: a plastic straw, a steel spoon, or a wooden pop stick?

3. What are the three parts every simple circuit needs?

4. In a circuit diagram, what does a circle with a cross inside it show?

5. Why do wires have a plastic coating?

Fix the mistake

6. Correct this statement: "One wire from the battery to the lamp is enough to light it."

7. Correct this statement: "When a switch is off, the circuit is closed."

8. Correct this statement: "The charge gets used up in the lamp, so less comes back to the battery."

9. Correct this statement: "In a diagram, a lamp is drawn as a little picture of a light bulb."

Year 6 Science: Drawing forces with arrows, and how levers help

Name: _____ Date: _____

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

Practice

1. A force arrow for a 20 N push is 4 cm long. How long should the arrow for a 40 N push be?

2. A cup sits still on a bench. Name the two forces on it and say how they compare.

3. A bike rolls along at a steady speed. The forward push is 60 N. How big is the backward force of friction and air resistance together?

4. A wheelbarrow is a lever. What is its pivot?

5. Why is a long-handled spade easier for turning soil than a short trowel?

Fix the mistake

6. Correct this statement: "A still book has no forces on it."

7. Correct this statement: "All force arrows can be the same length as long as they point the right way."

8. Correct this statement: "If something is moving, the forces on it cannot be balanced."

9. Correct this statement: "To make a lever easier, push close to the pivot."

Year 6 Science: Earth's water: stores, clouds, vapour and the water we use

Name: _____ Date: _____

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

Practice

1. A shower uses 9 litres a minute. How much water does a 6-minute shower use?

2. Someone cuts their shower from 10 minutes to 5 minutes. With 9 litres a minute, how much water do they save each day?

3. What are clouds made of?

4. A puddle on the playground is gone by lunchtime. Where did the water go?

5. Why can't a shipwrecked sailor drink seawater to stay alive?

Fix the mistake

6. Correct this statement: "The white cloud above a boiling jug is water vapour."

7. Correct this statement: "Clouds are made of water vapour."

8. Correct this statement: "Most of Earth's water is fresh, because rivers and lakes are everywhere."

9. Correct this statement: "In the bore table, 10.1 m means more water than 9.0 m."

Year 6 Science: Earth's fresh water: ice, lakes, rivers and groundwater

Name: _____ Date: _____

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

Practice

1. If all of Earth's water was 1000 mL, how much would be fresh water?

2. Which store holds the most fresh water?

3. What is an aquifer?

4. Where does Christchurch get its tap water from?

5. In a 100-square grid of Earth's fresh water only, about how many squares would groundwater get?

Fix the mistake

6. Correct this statement: "Most fresh water is in lakes and rivers."

7. Correct this statement: "Groundwater is an underground lake or river."

8. Correct this statement: "With 2.5% fresh water, people can use 2.5% of all Earth's water."

Year 6 Science: Traits, inheritance and variation in living things

Name: _____ Date: _____

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

Practice

1. Which of these is a trait: the colour of a dog's coat, the dog's name, or the dog's favourite toy?

2. Does the length of a cat's tail fall into clear groups or a range?

3. Two kōwhai seedlings come from the same tree. One grows tall in the sun and one stays small in deep shade. What caused the difference?

4. White and brown mice live in a dark, brown forest. Owls hunt them by sight. Which colour will probably become more common, and why?

5. In Room 6's histogram, how many leaves were 8.0 cm or longer?

Fix the mistake

6. Correct this statement: "Brothers and sisters from the same parents are exactly the same."

7. Correct this statement: "Every trait comes only from the parents."

8. Correct this statement: "A histogram has gaps between the bars, like a bar graph."

9. Correct this statement: "Measuring the five biggest leaves on a tree shows how leaf size varies."

Year 6 Science: Blood, the heart and how food reaches every part of you

Name: _____ Date: _____

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

Practice

1. Which blood vessels carry blood away from the heart?

2. Where do digested nutrients get into the blood?

3. Why are capillary walls so thin?

4. Tama counts 18 beats in 15 seconds. What is his pulse in beats per minute?

5. An animation shows blood flowing. What is one thing it is not so good at showing?

Fix the mistake

6. Correct this statement: "Arteries carry blood to the heart and veins carry it away."

7. Correct this statement: "Blood in veins is blue."

8. Correct this statement: "Nutrients go straight from the stomach to the muscles."

9. Correct this statement: "The heart makes the blood."

Year 6 Science: Habitats: measuring their features and who lives where

Name: _____ Date: _____

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

Practice

1. Name two physical features of a habitat you could measure.

2. A plant needs full sun and dry, sandy soil. Would it grow better on a sand dune or on a forest floor?

3. Where would you expect to find moss in a school playground?

4. In Room 10's transect, how much cooler was it at 10 m than at 0 m?

5. You want to grow lettuces, which like some shade on hot summer afternoons. Where in an NZ garden could you plant them?

Fix the mistake

6. Correct this statement: "A habitat is just the home an animal sleeps in, like a nest."

7. Correct this statement: "Measuring only one spot is enough to describe a habitat."

8. Correct this statement: "In New Zealand the sunniest side of a garden is the south side."

Answer key (for parents and tutors)

1. Is melting butter for a cake a chemical change or a physical change?
   A physical change: it is still butter, and it goes solid again when it cools.
2. A steel nail left outside turns orange and flaky. What clue is this, and what kind of change is it?
   A colour change, with a new flaky solid; it is a chemical change called rusting, a kind of corrosion.
3. In the reaction wood + oxygen → ash + smoke + carbon dioxide, what are the reactants?
   Wood and oxygen, the substances before the arrow.
4. Why can a cake never be turned back into batter?
   Baking made new substances, and they cannot be turned back into the ingredients.
5. Name a chemical change that happens inside your own body.
   Digestion, which breaks food into new, smaller substances.
6. Correct this statement: "Ice melting is a chemical change because it looks different."
   Melting is a physical change: the water is still water, and it freezes back into ice.
7. Correct this statement: "Any bubbles mean a chemical change."
   Bubbles are only a clue; boiling water bubbles too, but no new substance is made.
8. Correct this statement: "The products are the things you mix together at the start."
   The things you start with are the reactants; the products are the new substances made at the end.
9. Correct this statement: "Salt dissolving in water makes a new substance, because the salt disappears."
   The salt is still there, spread through the water, and you get it back when the water dries up, so it is a physical change.

Answer key (for parents and tutors)

1. A lamp will not light because one wire has come loose. Is the circuit open or closed?
   Open: there is a gap, so no charge flows.
2. Which of these would close the gap in a circuit: a plastic straw, a steel spoon, or a wooden pop stick?
   The steel spoon, because steel is a metal and a conductor.
3. What are the three parts every simple circuit needs?
   A power source (a cell or battery), wires, and a load such as a lamp.
4. In a circuit diagram, what does a circle with a cross inside it show?
   A lamp.
5. Why do wires have a plastic coating?
   Plastic is an insulator, so it keeps the charge in the wire and away from your fingers.
6. Correct this statement: "One wire from the battery to the lamp is enough to light it."
   The lamp needs two wires so charge can go out from the battery and come back; it must be a complete loop.
7. Correct this statement: "When a switch is off, the circuit is closed."
   Off means the switch has opened a gap, so the circuit is open and no charge flows.
8. Correct this statement: "The charge gets used up in the lamp, so less comes back to the battery."
   The charge flows all the way round and back; it is energy that the lamp uses, not the charge.
9. Correct this statement: "In a diagram, a lamp is drawn as a little picture of a light bulb."
   A lamp is drawn as a circle with a cross inside it, the standard symbol.

Answer key (for parents and tutors)

1. A force arrow for a 20 N push is 4 cm long. How long should the arrow for a 40 N push be?
   8 cm, because the force is twice as big.
2. A cup sits still on a bench. Name the two forces on it and say how they compare.
   Weight pulls it down and the bench's support force pushes it up; they are the same size.
3. A bike rolls along at a steady speed. The forward push is 60 N. How big is the backward force of friction and air resistance together?
   60 N, because steady speed means the forces are balanced.
4. A wheelbarrow is a lever. What is its pivot?
   The wheel.
5. Why is a long-handled spade easier for turning soil than a short trowel?
   Your hands are farther from the pivot, so you need less force to lift the soil.
6. Correct this statement: "A still book has no forces on it."
   Its weight and the support force both act on it; they are balanced, so it stays still.
7. Correct this statement: "All force arrows can be the same length as long as they point the right way."
   The length shows the size, so a bigger force needs a longer arrow.
8. Correct this statement: "If something is moving, the forces on it cannot be balanced."
   Balanced forces can act on a moving object; it just keeps going at the same speed and direction.
9. Correct this statement: "To make a lever easier, push close to the pivot."
   Push as far from the pivot as you can; that needs the least force.

Answer key (for parents and tutors)

1. A shower uses 9 litres a minute. How much water does a 6-minute shower use?
   6 × 9 = 54 litres.
2. Someone cuts their shower from 10 minutes to 5 minutes. With 9 litres a minute, how much water do they save each day?
   5 fewer minutes × 9 = 45 litres.
3. What are clouds made of?
   Tiny drops of liquid water or tiny ice crystals, floating in the air.
4. A puddle on the playground is gone by lunchtime. Where did the water go?
   It evaporated: it turned into invisible water vapour in the air.
5. Why can't a shipwrecked sailor drink seawater to stay alive?
   Seawater is too salty; the body uses even more water to get rid of the salt, so the sailor gets thirstier.
6. Correct this statement: "The white cloud above a boiling jug is water vapour."
   Water vapour is invisible; the white cloud is tiny drops of liquid that formed when the vapour cooled.
7. Correct this statement: "Clouds are made of water vapour."
   Clouds are tiny drops of liquid water or ice crystals; the vapour itself cannot be seen.
8. Correct this statement: "Most of Earth's water is fresh, because rivers and lakes are everywhere."
   About 96.54% of Earth's water is in the oceans, which are too salty to drink.
9. Correct this statement: "In the bore table, 10.1 m means more water than 9.0 m."
   The numbers are metres below the ground, so 10.1 m means the water is deeper down and the level has fallen.

Answer key (for parents and tutors)

1. If all of Earth's water was 1000 mL, how much would be fresh water?
   2.5% of 1000 mL is 25 mL.
2. Which store holds the most fresh water?
   Ice caps, glaciers and permanent snow, with 68.7% of it.
3. What is an aquifer?
   A layer of rock or gravel that holds groundwater and lets it flow through.
4. Where does Christchurch get its tap water from?
   From aquifers deep under the Canterbury Plains.
5. In a 100-square grid of Earth's fresh water only, about how many squares would groundwater get?
   Groundwater is 30.1% of fresh water, so about 30 squares.
6. Correct this statement: "Most fresh water is in lakes and rivers."
   Most fresh water is frozen as ice, and most of the rest is groundwater; lakes and rivers hold well under 1% of it.
7. Correct this statement: "Groundwater is an underground lake or river."
   Most groundwater fills the tiny gaps between grains of soil and gravel and the cracks in rock, like water in a sponge.
8. Correct this statement: "With 2.5% fresh water, people can use 2.5% of all Earth's water."
   Most of that 2.5% is locked in ice far away, so the fresh water people can easily reach is far smaller.

Answer key (for parents and tutors)

1. Which of these is a trait: the colour of a dog's coat, the dog's name, or the dog's favourite toy?
   The colour of its coat, a feature of its body you can see; a name and a favourite toy are not part of the dog.
2. Does the length of a cat's tail fall into clear groups or a range?
   A range, because tail length can be any value.
3. Two kōwhai seedlings come from the same tree. One grows tall in the sun and one stays small in deep shade. What caused the difference?
   The environment: the amount of light changed how the trait turned out.
4. White and brown mice live in a dark, brown forest. Owls hunt them by sight. Which colour will probably become more common, and why?
   Brown, because owls see white mice more easily, so more brown mice survive and pass on their colour.
5. In Room 6's histogram, how many leaves were 8.0 cm or longer?
   5 + 2 = 7 leaves.
6. Correct this statement: "Brothers and sisters from the same parents are exactly the same."
   Offspring are similar to each other but never identical; there is always some variation.
7. Correct this statement: "Every trait comes only from the parents."
   The environment matters too: a tree bent by wind or a plant grown in shade shows how surroundings change a trait.
8. Correct this statement: "A histogram has gaps between the bars, like a bar graph."
   In a histogram the bars touch, because the groups are a smooth range of values with no gaps between them.
9. Correct this statement: "Measuring the five biggest leaves on a tree shows how leaf size varies."
   Pick leaves from all around the plant, or the results will be too big and will hide the variation.

Answer key (for parents and tutors)

1. Which blood vessels carry blood away from the heart?
   Arteries.
2. Where do digested nutrients get into the blood?
   In the small intestine, through the walls of its finger-like bumps.
3. Why are capillary walls so thin?
   So nutrients, oxygen and wastes can pass between the blood and the body cells.
4. Tama counts 18 beats in 15 seconds. What is his pulse in beats per minute?
   18 × 4 = 72 beats per minute.
5. An animation shows blood flowing. What is one thing it is not so good at showing?
   All the parts at the same time, so it is hard to see the whole system at once.
6. Correct this statement: "Arteries carry blood to the heart and veins carry it away."
   It is the other way round: arteries take blood away from the heart, and veins bring it back.
7. Correct this statement: "Blood in veins is blue."
   Blood is always red; veins only look blue because you see them through your skin.
8. Correct this statement: "Nutrients go straight from the stomach to the muscles."
   Nutrients pass into the blood in the small intestine, travel through the heart, and leave the blood through capillaries.
9. Correct this statement: "The heart makes the blood."
   The heart is a pump; it pushes blood round the body, but the blood is made elsewhere, inside your bones.

Answer key (for parents and tutors)

1. Name two physical features of a habitat you could measure.
   Any two of: temperature, sun exposure, how damp the soil is, wind, type of ground.
2. A plant needs full sun and dry, sandy soil. Would it grow better on a sand dune or on a forest floor?
   A sand dune, which is sunny with dry, sandy soil.
3. Where would you expect to find moss in a school playground?
   In a damp, shady place, such as the shady side of a building or under a tree.
4. In Room 10's transect, how much cooler was it at 10 m than at 0 m?
   22 − 14 = 8 °C cooler.
5. You want to grow lettuces, which like some shade on hot summer afternoons. Where in an NZ garden could you plant them?
   Somewhere with sun in the morning but shade in the afternoon, such as the east side of a fence or tree.
6. Correct this statement: "A habitat is just the home an animal sleeps in, like a nest."
   A habitat is the whole place where an organism finds food, water, shelter and space.
7. Correct this statement: "Measuring only one spot is enough to describe a habitat."
   Measure at many stops along a transect, the same way each time, to see how the features change.
8. Correct this statement: "In New Zealand the sunniest side of a garden is the south side."
   We are in the southern half of the world, so the sun is in the northern sky and the north side gets the most sun.