SCIENCE · SEASONS · GRADES K–1

The Four Seasons

A seasons wheel with a tree in spring, summer, fall and winter to color and trace, then draw your favorite season.



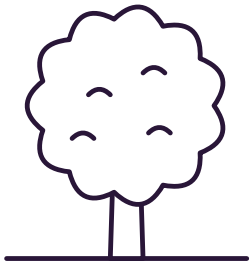
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1



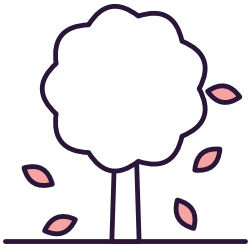
spring

2



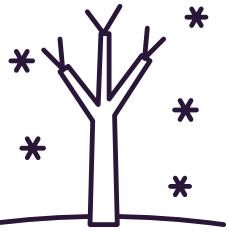
summer

3



fall

4



winter

The Four Seasons

Draw yourself in your favorite season.

Draw the weather outside today.

Art © Kevin Coulston

SCIENCE · SEASONS · GRADES K–2

Seasons Sort

Write twelve things under the season they fit best, from mittens to raking leaves.

Name: _____ **Date:** _____



Write each one under the season it fits best.

sunscreen | picking apples | rain boots | baby birds hatching | building a snowman | a popsicle on a hot day | a warm coat | planting seeds | a swimsuit | raking leaves | leaves turning orange | mittens

Winter	Spring	Summer	Fall

What is your favorite season? Why?

_____

_____

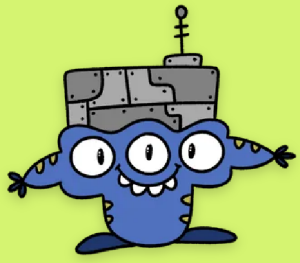
Art © Kevin Coulston

SCIENCE · SEASONS · GRADES 2–4

Why Do We Have Seasons?

Read how Earth's tilt makes the seasons, mark seven facts true or false and fix one.

Name: _____ **Date:** _____



Earth is **tilted**. As it travels around the sun each year, the half of Earth tipped **toward** the sun gets more direct sunlight and longer days: it has **summer**. The half tipped **away** from the sun has **winter**.

Circle True or False.

Earth takes one year to travel around the sun.	True	False
We have summer because Earth gets much closer to the sun.	True	False
Earth is tilted.	True	False
When it is summer in the United States, it is winter in Australia.	True	False
Summer days have more hours of daylight than winter days.	True	False
Every place on Earth has four very different seasons.	True	False
In winter, sunlight hits the ground at a low slant.	True	False

Pick one false sentence and fix it so it is true.

_____

_____

Art © Kevin Coulston

SCIENCE · SEASONS · GRADES 1–3

Animals in Winter

Sort nine animals by how they get through winter: hibernate, migrate or adapt.



Name: _____ **Date:** _____

Animals get ready for winter in different ways. Some **hibernate**: they sleep deeply all winter. Some **migrate**: they travel somewhere warmer. Some **adapt**: they stay and change how they live.

Write each animal under what it does in winter.

humpback whale · deer (grows a thick coat) · monarch butterfly · little brown bat · groundhog · Canada goose · snowshoe hare (turns white) · squirrel (stores nuts) · black bear

Hibernate	Migrate	Adapt

If you were an animal, would you hibernate, migrate or adapt? Why?

_____

_____

Art © Kevin Coulston

SCIENCE · SEASONS · GRADES K–2

Season Riddles

Read eight clues and write the season each one tells about, then write your own riddle.

Name: _____ **Date:** _____



Word bank

winter | spring | summer | fall

Read each clue. Write the season. Each season is used twice.

1. Leaves change color and fall to the ground. _____

2. Snow falls and ponds freeze. _____

3. Flowers bloom and baby animals are born. _____

4. It is the hottest season, with the longest days. _____

5. Farmers pick pumpkins and apples. _____

6. Bears are asleep in their dens. _____

7. Rain helps new green plants grow. _____

8. Kids go swimming to cool off. _____

Write your own season riddle for a friend to solve.

_____

_____

Art © Kevin Coulston

SCIENCE · DAY AND NIGHT · GRADES K–1

Day or Night?

Cut out ten cards and glue each one under day or night.



Name: _____ **Date:** _____

Glue each card under day or night.

Day	Night

✂ Cut out the cards on the dashed lines.

go to sleep	go to school	see the stars	the rooster crows	put on pajamas
eat breakfast	play at recess	bats fly	see the sun	owls hunt

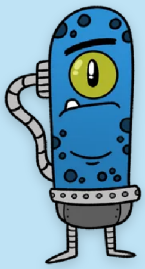
Art © Kevin Coulston

SCIENCE · DAY AND NIGHT · GRADES 2–4

Earth Spins: Day and Night

Label the sun, Earth, day and night on the diagram, then fill in five sentences about Earth's spin.

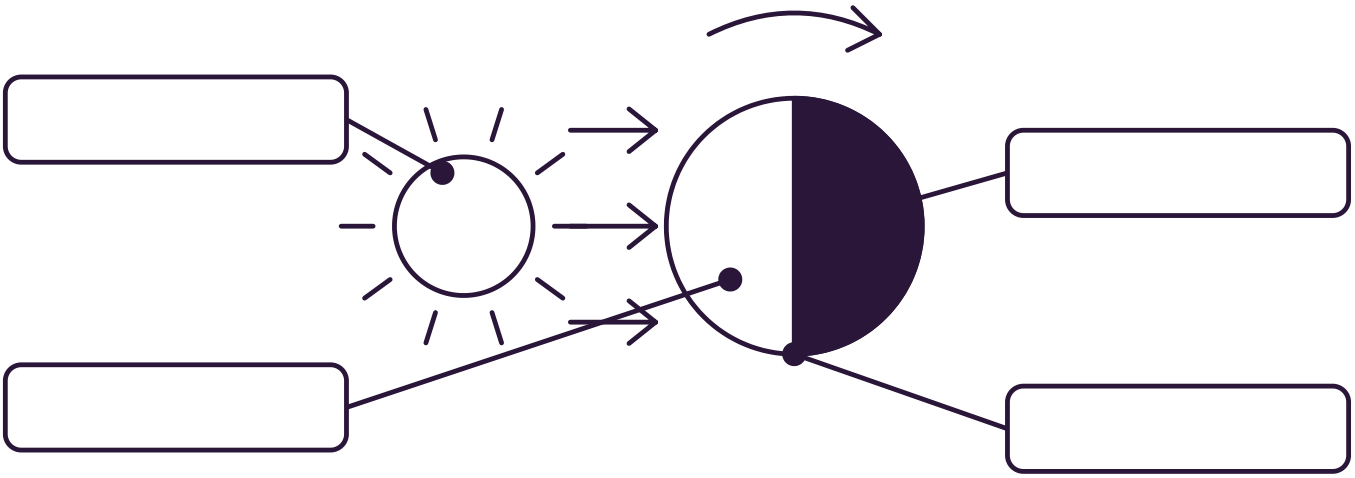
Name: _____ **Date:** _____



Word bank

sun | Earth | day | night | east | west | 24

1. Label the diagram. The arrow shows Earth spinning.



2. Fill in the blanks.

1. Earth spins around once every _____ hours.
2. The side of Earth facing the sun has _____.
3. The side facing away from the sun has _____.
4. The sun seems to rise in the _____.
5. The sun seems to set in the _____.

Art © Kevin Coulston

SCIENCE · DAY AND NIGHT · GRADES 1–3

Nocturnal or Diurnal?

Sort ten animals into the ones awake at night and the ones awake in the day.



Name: _____ **Date:** _____

Nocturnal animals sleep in the day and are awake at night. **Diurnal** animals are awake in the day and sleep at night, like most people.

Write each animal in the right column.

squirrel · butterfly · honeybee · bat · raccoon · firefly · moth · eagle · chicken · owl

Nocturnal (awake at night)	Diurnal (awake in the day)

Big eyes help many nocturnal animals. Why do you think that is?

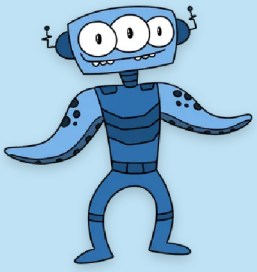
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Art © Kevin Coulston

SCIENCE · DAY AND NIGHT · GRADES 3–5

How Long Is the Day?



Write the sunrise and sunset times once a week for six weeks, work out the hours of daylight and explain the change.

Name: _____ **Date:** _____

How to do it: once a week, look up today's sunrise and sunset times in a weather app or newspaper. Subtract to find the hours of daylight. **Example:** sunrise 7:00 a.m., sunset 5:00 p.m. = 10 hours.

Date	Sunrise	Sunset	Hours of daylight
Week 1			
Week 2			
Week 3			
Week 4			
Week 5			
Week 6			

Longest day _____ **Shortest day** _____

Are the days getting longer or shorter? What season is coming next?

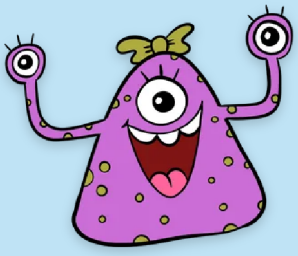
Art © Kevin Coulston

SCIENCE · DAY AND NIGHT · GRADES K–1

My Day and My Night

Draw something you do in the day and at night, then trace a sentence.

Name: _____ **Date:** _____



In the day I...

At night I...

In the day we see the sun. At night we see the moon and stars.

sun

moon and stars

Trace the sentence.

Earth spins every day.

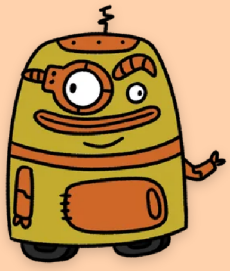
Art © Kevin Coulston

SCIENCE · STARS AND CONSTELLATIONS · GRADES 1–4

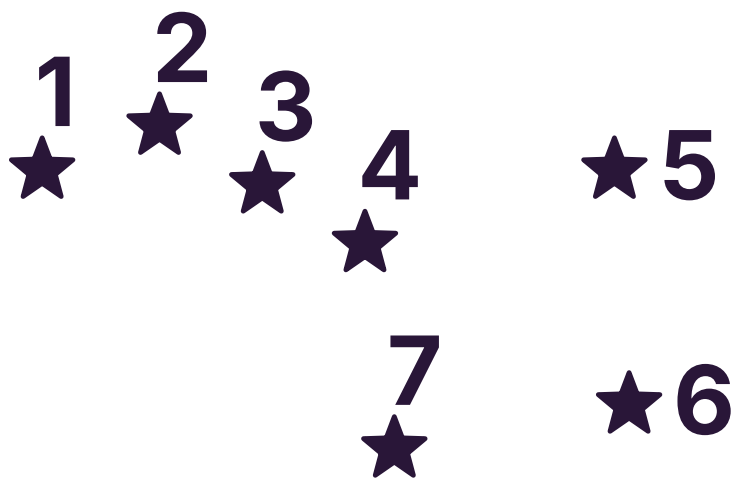
Connect the Big Dipper

Connect the seven stars of the Big Dipper, then invent, draw and name your own constellation.

Name: _____ **Date:** _____



A **constellation** is a group of stars that makes a picture in the sky. The **Big Dipper** looks like a giant spoon. Connect the stars from 1 to 7, then draw one more line from 7 back to 4.



Make up your own constellation. Draw the stars as dots, then connect them.

Its name _____

It looks like _____

Number of stars _____

Art © Kevin Coulston

SCIENCE · STARS AND CONSTELLATIONS · GRADES 2–5

Stars: True or False?

Eight facts about stars to mark true or false, then fix two false ones.

Name: _____ **Date:** _____



Circle True or False.

Stars are giant balls of hot, glowing gas.	True	False
The sun is the closest star to Earth.	True	False
Stars are only in the sky at night.	True	False
Stars twinkle because moving air bends their light.	True	False
Some stars are much bigger than our sun.	True	False
Shooting stars are stars falling to Earth.	True	False
People have counted every star in the sky.	True	False
Stars last forever and never change.	True	False

Pick two false sentences and fix them so they are true.

_____

_____

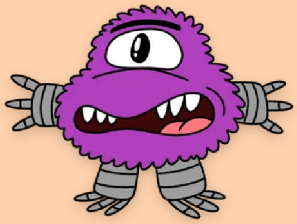
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Art © Kevin Coulston

SCIENCE · STARS AND CONSTELLATIONS · GRADES 3–5

Space Words

Match constellation, galaxy, Milky Way, telescope, astronomer and light-year to their meanings, then answer two questions.



Name: _____ **Date:** _____

1. Draw a line from each word to its meaning.

constellation	a tool that makes faraway things look closer
galaxy	the galaxy our solar system is in
Milky Way	a scientist who studies stars and space
telescope	how far light travels in one year
astronomer	a group of stars that makes a picture
light-year	a huge group of billions of stars

2. Circle the answer.

Stars look tiny to us because they are

very small · very far away · very cold

To look at a faraway star, an astronomer uses a

microscope · telescope · thermometer

Art © Kevin Coulston

SCIENCE · STARS AND CONSTELLATIONS · GRADES 3–5

Star Colors

Number four star colors from hottest to coolest, then fill in four sentences about stars and our sun.



Name: _____ **Date:** _____

Stars come in different colors. The hottest stars glow **blue-white**. Cooler stars glow **yellow**, then **orange**, and the coolest glow **red**. Our sun is a medium-size yellow star. It looks bigger and brighter than other stars only because it is much closer to us.

1. Number the star colors from hottest (1) to coolest (4).

- [ ] orange
- [ ] blue-white
- [ ] red
- [ ] yellow

Word bank

yellow | blue-white | closer | gas

2. Fill in the blanks.

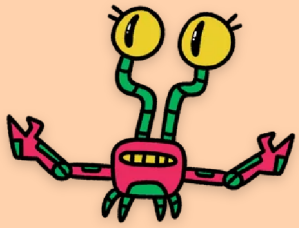
1. Stars are made of hot, glowing _____.
2. Our sun is a _____ star.
3. The hottest stars are _____.
4. The sun looks bigger than other stars because it is _____.

Art © Kevin Coulston

SCIENCE · STARS AND CONSTELLATIONS · GRADES 2–5

Night Sky Journal

Look at the night sky five times: is the moon out, how many stars can you count and what did you notice?



Name: _____ **Date:** _____

Place I looked _____ **Grown-up with me** _____

Night	Date and time	Is the moon out?	Stars I counted	What I noticed
1				
2				
3				
4				
5				

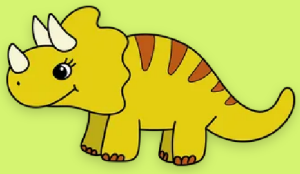
Draw the best part of the sky you saw.

Art © Kevin Coulston

SCIENCE · DINOSAURS · GRADES 1–3

Plant Eater or Meat Eater?

Sort ten dinosaurs into plant eaters and meat eaters, with a clue about their teeth.



Name: _____ **Date:** _____

Teeth clue: plant eaters had flat or peg-like teeth for munching leaves. Meat eaters had sharp, pointed teeth.

Write each dinosaur in the right column.

Velociraptor · Tyrannosaurus rex · Allosaurus · Stegosaurus · Brachiosaurus · Ankylosaurus · Parasaurolophus · Spinosaurus · Giganotosaurus · Triceratops

Plant eater (herbivore)	Meat eater (carnivore)

Why do you think plant eaters needed flat teeth?

_____

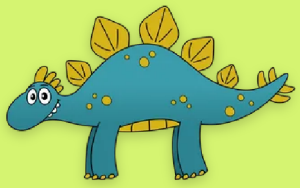
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Art © Kevin Coulston

SCIENCE · DINOSAURS · GRADES 2–4

A Paleontologist's Tools

Match six tools to the jobs they do at a fossil dig.



Name: _____ **Date:** _____

A **paleontologist** is a scientist who digs up and studies fossils, like dinosaur bones.

Draw a line from each tool to its job.

brush	measures how long a bone is
hammer and chisel	sweeps dirt and sand off a bone
magnifying glass	record where each bone was found
notebook and camera	shows tiny details up close
plaster jacket	chip away the hard rock around a fossil
tape measure	wraps a bone so it will not break on the way to the lab

Would you like to be a paleontologist? Why or why not?

_____

_____

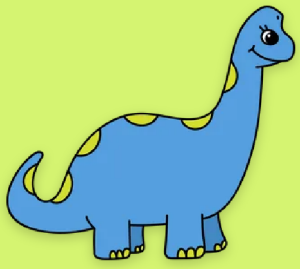
Art © Kevin Coulston

SCIENCE · DINOSAURS · GRADES 2–4

How Long Were Dinosaurs?

Use the lengths of four dinosaurs to compare and subtract, then measure your classroom.

Name: _____ **Date:** _____



About how long each dinosaur was, from nose to tail:
Brachiosaurus: about 85 feet · **Tyrannosaurus rex:** about 40 feet · **Triceratops:** about 30 feet · **Velociraptor:** about 6 feet

Use the lengths to answer.

1. Which dinosaur was the longest? _____

2. Which dinosaur was the shortest? _____

3. How much longer was T. rex than Triceratops? _____

4. How much longer was Brachiosaurus than T. rex? _____

5. How many Velociraptors in a row would be as long as a Triceratops? _____

6. Measure your classroom. How long is it? _____

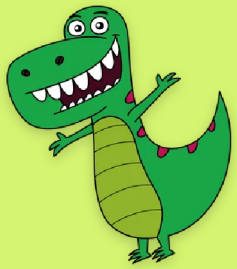
Art © Kevin Coulston

SCIENCE · DINOSAURS · GRADES 1–4

Dinosaurs: True or False?

Eight facts about dinosaurs to mark true or false, then fix two false ones.

Name: _____ **Date:** _____



Circle True or False.

Dinosaurs lived millions of years ago.	True	False
People and dinosaurs lived at the same time.	True	False
Birds are related to dinosaurs.	True	False
Every dinosaur was huge.	True	False
Some dinosaurs had feathers.	True	False
Pterodactyls were dinosaurs that could fly.	True	False
We learn about dinosaurs from fossils.	True	False
Dinosaurs hatched from eggs.	True	False

Pick two false sentences and fix them so they are true.

_____

_____

_____

Art © Kevin Coulston

SCIENCE · DINOSAURS · GRADES 2–4

My Dinosaur Report

A research template for one dinosaur: a drawing, what its name means, when it lived, what it ate, how big it was and fun facts.



Name: _____ **Date:** _____

Draw your dinosaur.

My dinosaur _____

Its name means _____

When it lived _____

Plant or meat eater? _____

How long it was _____

Where its fossils were found _____

Three facts about my dinosaur:

_____

_____

_____

How did it stay safe or find food?

_____

_____

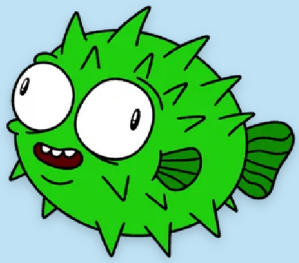
Where I found my facts _____

Art © Kevin Coulston

SCIENCE · OCEANS · GRADES 3–5

The Ocean Zones

Label the sunlight, twilight and midnight zones, the abyss and a trench, then answer three questions.

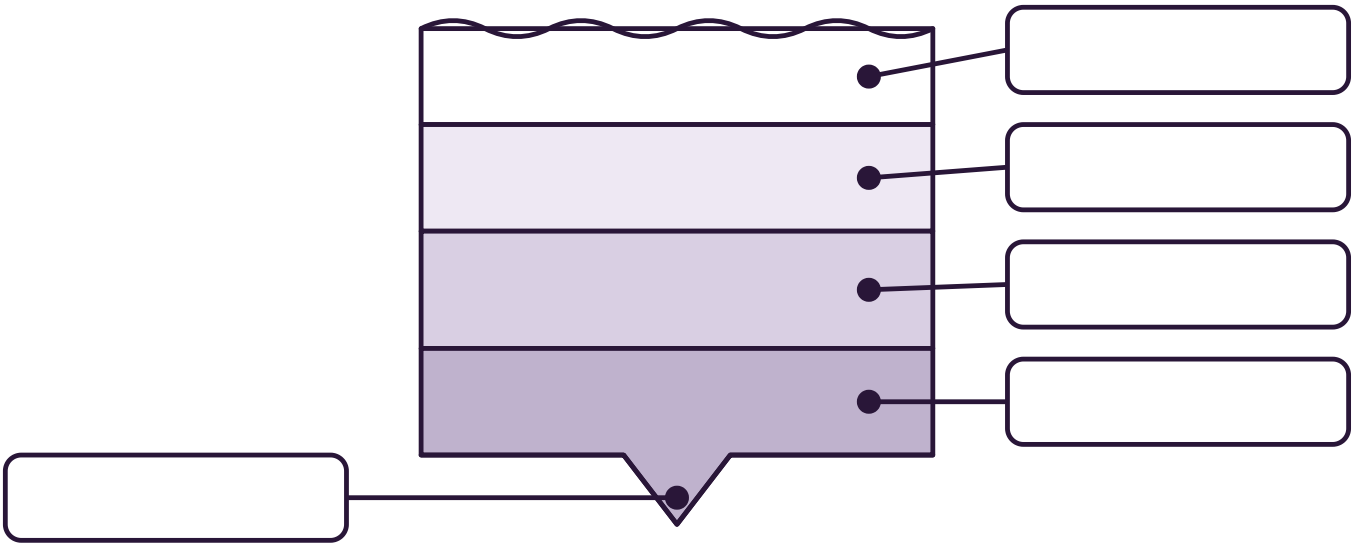


Name: _____ **Date:** _____

Word bank

sunlight zone | twilight zone | midnight zone | abyss | trench

1. Label the ocean zones from the top down.



2. Circle the answer.

Which zone gets enough sunlight for seaweed to grow?

sunlight zone | midnight zone | abyss

An anglerfish makes its own light. Where does it live?

sunlight zone | midnight zone | a tide pool

The deepest places in the ocean are

trenches | coral reefs | beaches

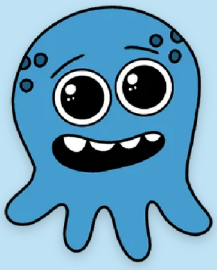
Art © Kevin Coulston

SCIENCE · OCEANS · GRADES 2–4

Sea Animal Adaptations

Match seven sea animals to the body part or behavior that helps them live in the ocean.

Name: _____ **Date:** _____



An **adaptation** is a body part or a behavior that helps an animal live in its habitat.

Draw a line from each sea animal to its adaptation.

octopus	strong claws pinch and grab food
sea turtle	a glowing lure draws food close in the dark
seal	flippers paddle it for miles
jellyfish	clicks and listens to the echoes to find fish
crab	stinging tentacles catch food
dolphin	thick blubber keeps it warm
anglerfish	squirts ink to escape from enemies

Which adaptation would you like to have? Why?

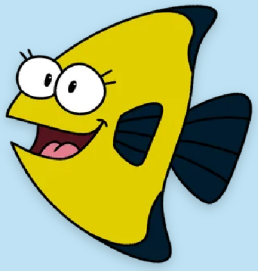
Art © Kevin Coulston

SCIENCE · OCEANS · GRADES 2–5

Coral Reefs

Seven coral reef facts to mark true or false, then draw a reef with three animals that live there.

Name: _____ **Date:** _____



Coral reefs are called the **rainforests of the sea** because so many kinds of living things live there.

Circle True or False.

Coral is an animal.	True	False
Coral reefs grow in warm, shallow, clear water.	True	False
The Great Barrier Reef is near Australia.	True	False
Coral reefs grow many feet every year.	True	False
Fish use reefs to hide and to find food.	True	False
Water that gets too warm can make coral sick and turn it white.	True	False
Coral reefs cover most of the ocean floor.	True	False

Draw a coral reef with three animals that live there. Label them.

Art © Kevin Coulston

SCIENCE · OCEANS · GRADES 1–4

Help the Ocean

Color the choices that help the ocean and put an X on the ones that hurt it, then plan how your class can help.



Name: _____ **Date:** _____

Color the choices that help the ocean. Put an X on the ones that hurt it.

pick up trash at the beach	let balloons float away	use a water bottle you can refill
leave trash on the sand	recycle cans and bottles	throw old fishing line in the water
bring a cloth bag to the store	pour paint down a storm drain	leave shells and sea animals where you find them
stand on coral when you snorkel	say no to a plastic straw	drop plastic bags outside

One way my class can help the ocean:

_____

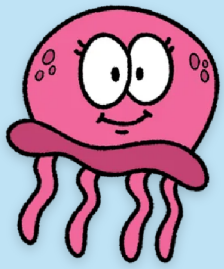
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Art © Kevin Coulston

SCIENCE · OCEANS · GRADES 2–5

Salt Water Float Test

An experiment: does an egg sink or float in fresh water and in salty water like the ocean?



Name: _____ **Date:** _____

You need: 2 clear cups, warm water, salt, a spoon and a raw egg. **Do it:** fill both cups halfway with water. Stir 6 big spoonfuls of salt into one cup until it dissolves. Gently lower the egg into each cup with the spoon.

Cup	I predict the egg will…	What really happened
Plain water		
Salt water		

Draw the egg in each cup.

Ocean water is salty. Why is it easier to float in the ocean than in a pool?

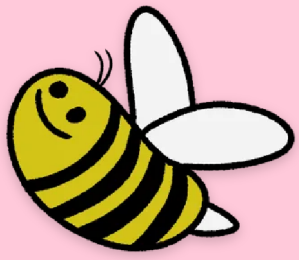
Art © Kevin Coulston

SCIENCE · INSECTS AND SPIDERS · GRADES 1–3

Is It an Insect?

Circle insect or not an insect for ten small animals, using the six-legs rule.

Name: _____ **Date:** _____



An insect has 6 legs, 3 body parts and 2 antennae. A spider is not an insect.



insect: 6 legs, 3 body parts



spider: 8 legs, 2 body parts

Circle Insect or Not an insect.

ant	Insect	Not an insect
spider	Insect	Not an insect
ladybug	Insect	Not an insect
earthworm	Insect	Not an insect
honeybee	Insect	Not an insect
butterfly	Insect	Not an insect
snail	Insect	Not an insect
grasshopper	Insect	Not an insect
centipede	Insect	Not an insect
beetle	Insect	Not an insect

Art © Kevin Coulston

SCIENCE · INSECTS AND SPIDERS · GRADES 2–3

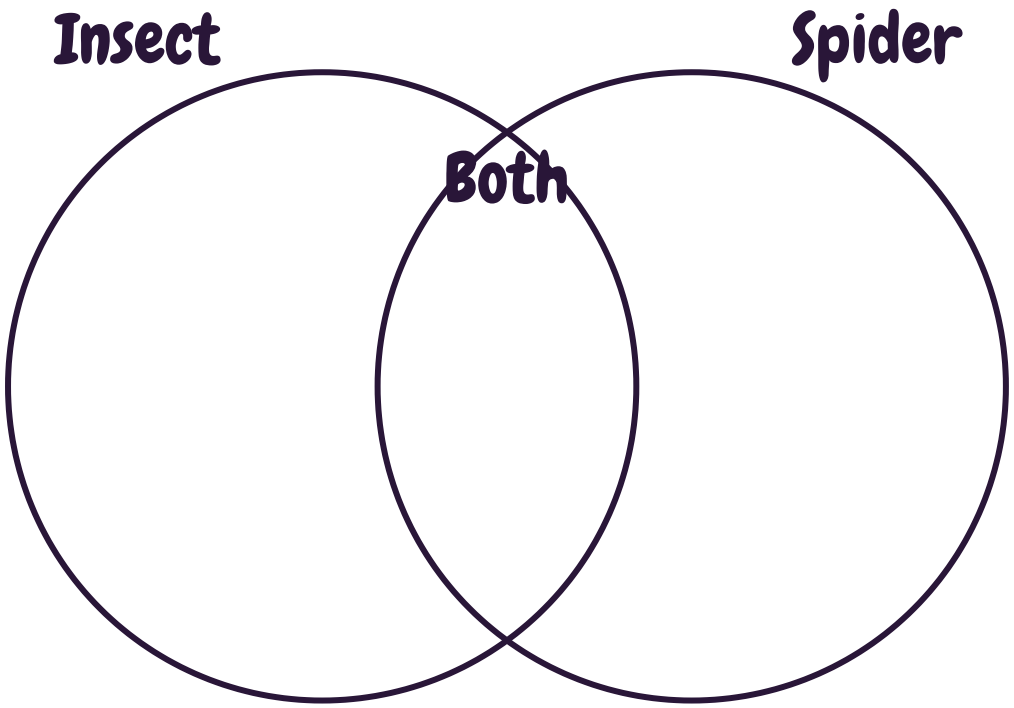
Insect or Spider?

Sort ten facts into insect, spider or both: a compare and contrast sheet.



Name: _____ **Date:** _____

Write the number of each fact in the right part of the diagram.

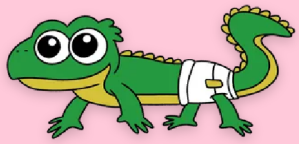


1. has 6 legs
2. has 8 legs
3. has 3 body parts
4. has 2 body parts
5. has antennae
6. spins webs to catch food
7. many kinds have wings
8. has a hard outside skeleton
9. hatches from an egg
10. has no backbone

Art © Kevin Coulston

SCIENCE · INSECTS AND SPIDERS · GRADES K–2

The Life Cycle of a Ladybug



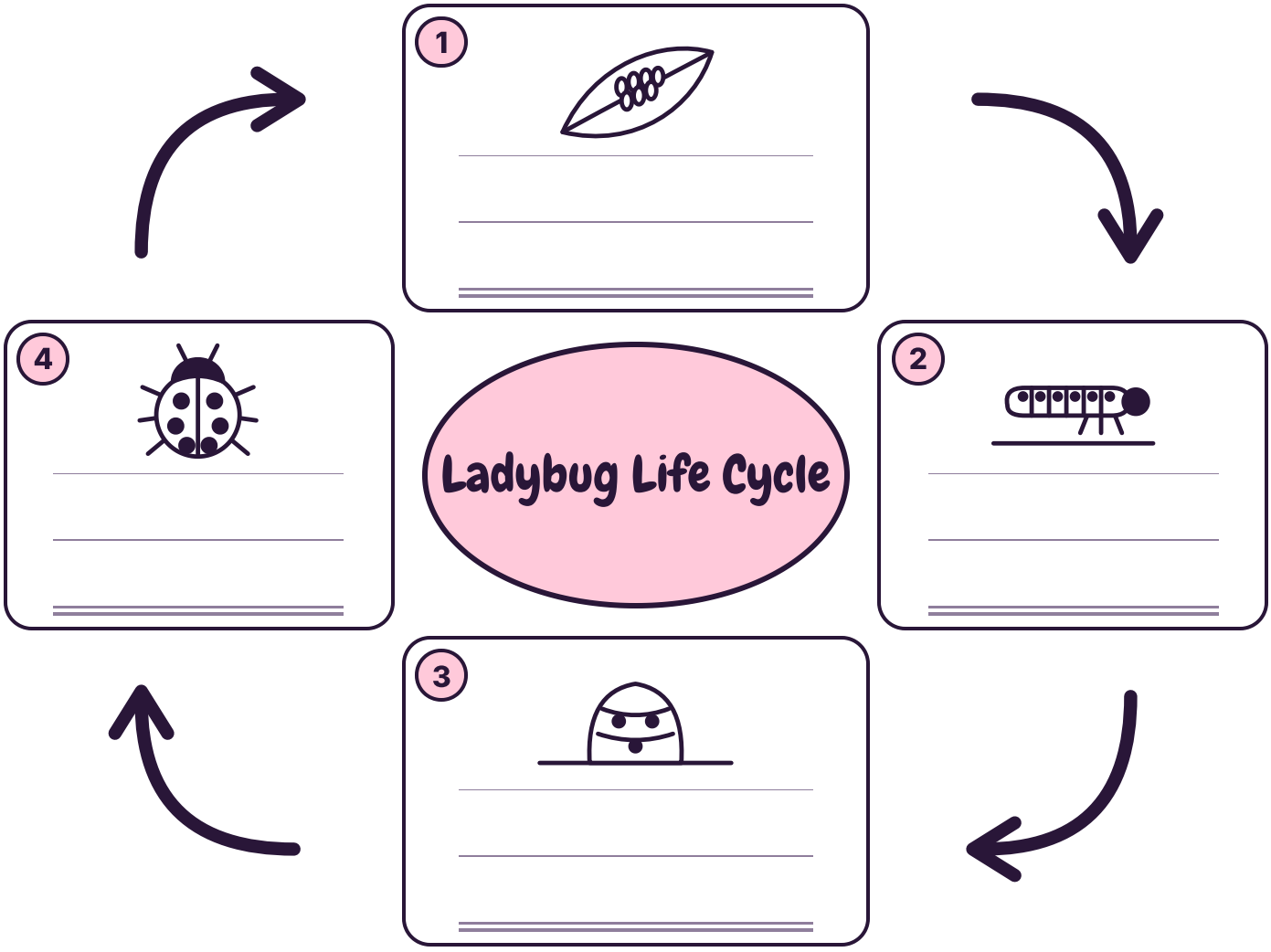
Label the egg, larva, pupa and adult ladybug with a word bank, then answer what a ladybug larva eats.

Name: _____ **Date:** _____

Word bank

eggs | larva | pupa | ladybug

Write the name of each stage.



Circle the answer.

A ladybug larva eats tiny bugs called aphids | fish | seeds

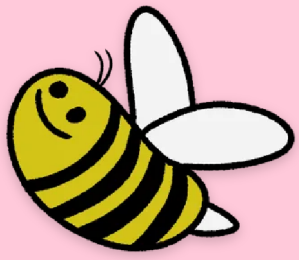
Art © Kevin Coulston

SCIENCE · INSECTS AND SPIDERS · GRADES 1–3

Bugs at Work

Match six helpful bugs to the jobs they do, then draw your favorite.

Name: _____ **Date:** _____



Draw a line from each bug to the job it does.

honeybee	spins thread we use to make silk
ladybug	digs tunnels that let air and water into soil
dragonfly	cleans up animal waste
dung beetle	eats mosquitoes
ant	carries pollen from flower to flower
silkworm	eats aphids that hurt garden plants

Draw your favorite helpful bug doing its job.

Art © Kevin Coulston

SCIENCE · INSECTS AND SPIDERS · GRADES K–3

Bug Hunt Log

Go on a bug hunt and record five bugs: where you found them, how many legs and whether they have wings.



Name: _____ **Date:** _____

Bug hunt rules: look under leaves, rocks and logs. Use your eyes and a magnifying glass. Do not touch bugs that sting or bite, and put every rock back where you found it.

Bug	Where I found it	Legs	Wings?	Draw it
1.				
2.				
3.				
4.				
5.				

Bugs I found _____ **Insects I found** _____

Art © Kevin Coulston

SCIENCE · BIRDS · GRADES 2–4

Beaks and What Birds Eat

Match seven beaks to the food they are shaped for, from a hummingbird to a pelican.

Name: _____ **Date:** _____



A bird's beak is a tool. Its shape tells you what the bird eats.

Draw a line from each bird to the beak and food that fit it.

hummingbird ●	● a big pouch under its beak scoops up fish
eagle ●	● a short, thick beak cracks seeds
duck ●	● a sharp, hooked beak tears meat
woodpecker ●	● a long, thin beak sips nectar from flowers
cardinal ●	● a bent beak strains tiny shrimp from water
pelican ●	● a wide, flat beak scoops plants from water
flamingo ●	● a strong, pointed beak drills wood for bugs

Which beak would you want for your favorite food?

_____

Art © Kevin Coulston

SCIENCE · BIRDS · GRADES 1–3

Parts of a Bird

Label the beak, eye, wing, tail and feet, then fill in two sentences.

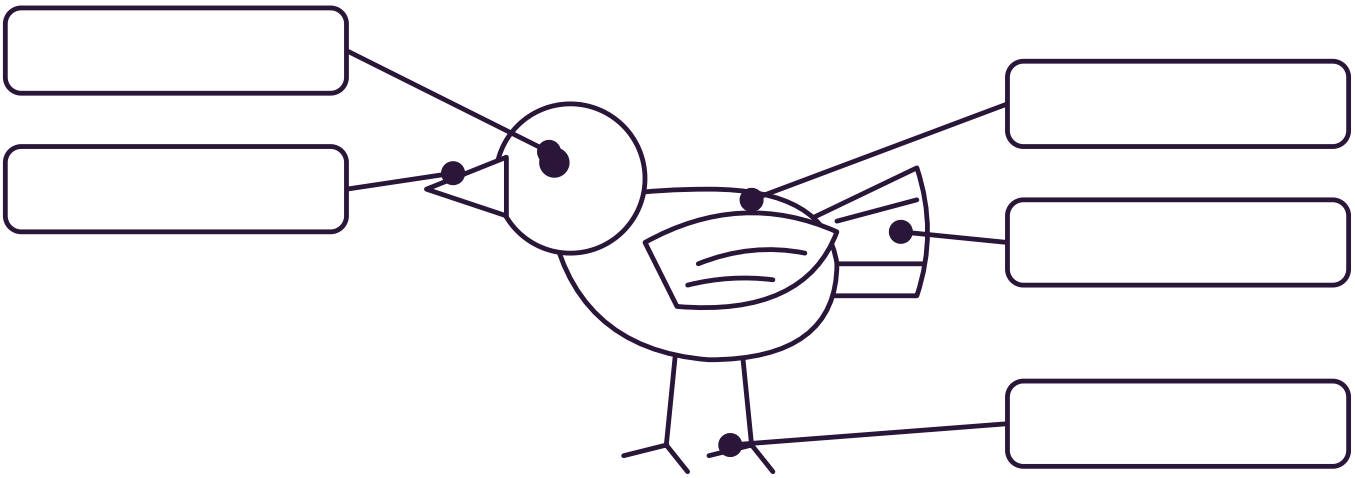
Name: _____ **Date:** _____



Word bank

beak | eye | wing | tail | feet

Write the name of each part.



Fill in the blanks.

1. A bird flaps each _____ to fly.

2. A bird uses its _____ to pick up food.

Art © Kevin Coulston

SCIENCE · BIRDS · GRADES K–2

What Makes a Bird?

Color the six things every bird has and put an X on the six it does not.



Name: _____ **Date:** _____

Color the 6 things every bird has. Put an X on the 6 things birds do not have.

feathers	fur	a beak
gills	wings	six legs
two legs	fins	lays eggs
teeth	a backbone	hands

Name a bird that cannot fly.

_____

Art © Kevin Coulston

SCIENCE · BIRDS · GRADES 1–4

Bird Watching Tally

Watch birds for 15 minutes, tally each kind you see and tell which one you saw the most.

Name: _____ **Date:** _____



How to do it: sit still by a window, a feeder or in a park for 15 minutes. Each time you see a bird, make a tally mark next to its kind. If you do not know its name, write what it looks like.

Place _____ **Time of day** _____

Kind of bird (or what it looks like)	Tally marks	Total
1.		
2.		
3.		
4.		
5.		
6.		

The bird I saw the most _____

The bird I saw the least _____

Art © Kevin Coulston

SCIENCE · BIRDS · GRADES 2–4

Why Do Birds Migrate?

Fill in five sentences about migration, then mark four facts true or false.

Name: _____ **Date:** _____



To **migrate** means to travel a long way each year when the seasons change.

Word bank

south · food · Arctic tern · flock · north

1. Fill in the blanks.

1. Many birds fly _____ in the fall.
2. They migrate to find more _____ in winter.
3. Birds often fly together in a group called a _____.
4. In spring, they fly back _____ to build nests.
5. The _____ flies from the Arctic to Antarctica and back every year.

2. Circle True or False.

All birds migrate.	True	False
Birds can use the sun and stars to find their way.	True	False
Some hummingbirds migrate too.	True	False
Penguins fly south for the winter.	True	False

Art © Kevin Coulston

SCIENCE · TREES AND LEAVES · GRADES 1–3

Parts of a Tree

Label the leaves, branch, trunk and roots, then match each part to its job.

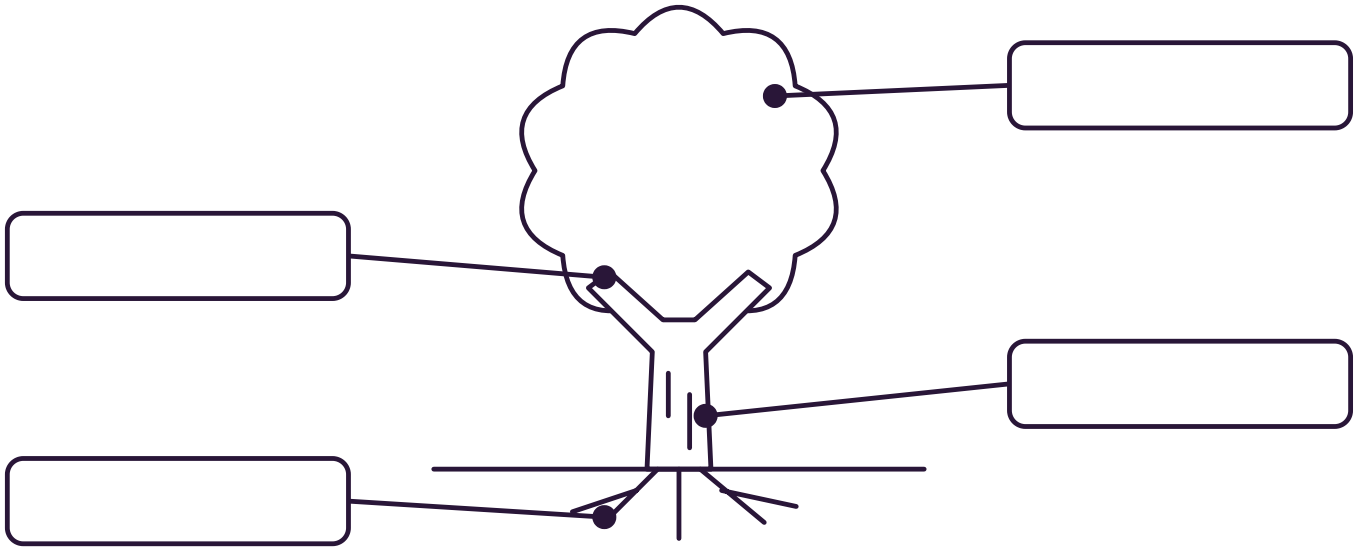
Name: _____ **Date:** _____



Word bank

leaves | branch | trunk | roots

1. Write the name of each part.



2. Draw a line from each part to its job.

roots ●	● make food from sunlight
trunk ●	● hold the leaves up to the sun
branches ●	● hold the tree in the ground and drink water
leaves ●	● holds the tree up and carries water

Art © Kevin Coulston

SCIENCE · TREES AND LEAVES · GRADES 1–3

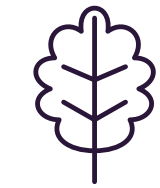
Leaf Shapes

Match an oak leaf, maple leaf, pine needles and ginkgo leaf to their names, then make a leaf rubbing.

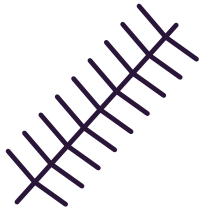
Name: _____ **Date:** _____

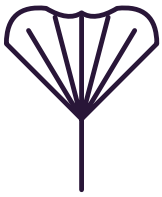


Draw a line from each leaf to its name.









- ginkgo leaf: shaped like a fan
- oak leaf: round bumps called lobes
- maple leaf: pointy lobes, like a hand
- pine needles: long, thin and sharp

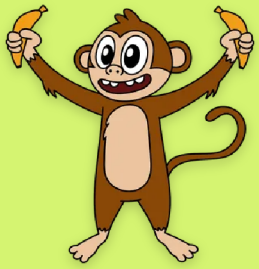
Leaf rubbing: put a leaf under this paper and rub over it with the side of a crayon.

Art © Kevin Coulston

SCIENCE · TREES AND LEAVES · GRADES 2–4

How Old Is the Tree?

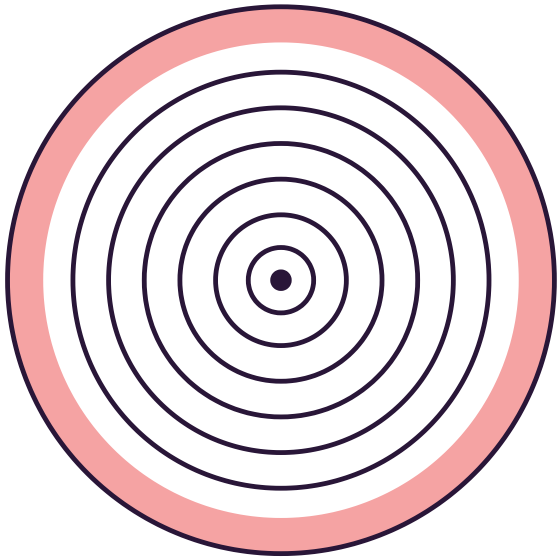
Count the growth rings on a tree stump to find its age, then answer what wide and thin rings mean.



Name: _____ **Date:** _____

Every year a tree grows one new **ring** of wood just under its bark. Count the rings on a stump to find out how old the tree was.

A tree stump. The bark is the gray ring around the outside.



1. How many rings? Do not count the bark. _____

2. How old was the tree? _____

3. It was cut down in 2026. When did it start to grow? _____

Circle the answer.

A wide ring means the tree had

a good growing year **a bad growing year**

A thin ring could mean there was

lots of rain **not much rain**

Art © Kevin Coulston

SCIENCE · TREES AND LEAVES · GRADES K–2

Gifts from Trees

Color the eight things we get from trees and put an X on the four we do not.

Name: _____ **Date:** _____



Color the 8 things we get from trees. Put an X on the 4 we do not.

paper	apples	glass
maple syrup	a wooden chair	a plastic bottle
shade on a hot day	fresh air to breathe	a metal spoon
a home for birds	cinnamon	a rock

Thank you, tree, for...

_____

Art © Kevin Coulston

SCIENCE · TREES AND LEAVES · GRADES K–3

Adopt a Tree

Pick a tree to visit: name it, make a bark rubbing, draw a leaf, measure the trunk and record four visits.

Name: _____ **Date:** _____



My tree's name _____ **Where it grows** _____

Bark rubbing: hold the paper on the trunk and rub with a crayon.

Draw one of its leaves (or needles).

Around the trunk (wrap a string, then measure it) _____

Visit	Date	What I see on my tree
1		
2		
3		
4		

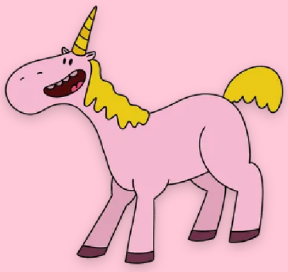
Art © Kevin Coulston

SCIENCE · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 3–5

Parts of a Flower

Label the petal, stamen, pistil, sepal, stem and leaf, then match four parts to their jobs.

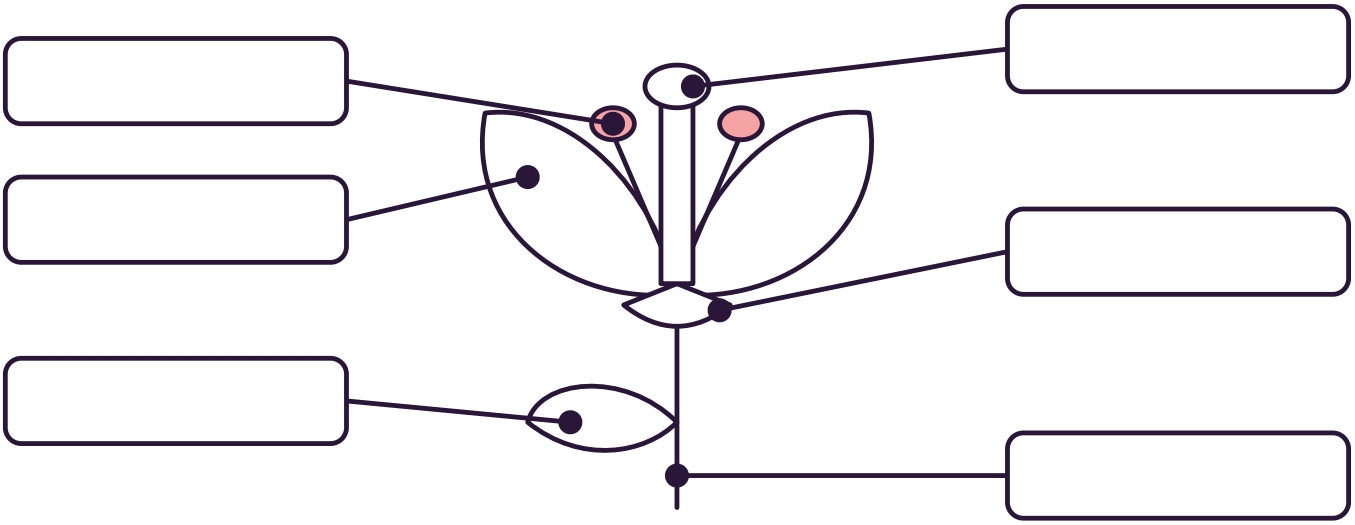
Name: _____ **Date:** _____



Word bank

petal | stamen | pistil | sepal | stem | leaf

1. Write the name of each part.



2. Draw a line from each part to its job.

petal ●	● protects the bud before it opens
stamen ●	● catches pollen and grows the seeds
pistil ●	● bright colors bring bees and butterflies
sepal ●	● makes pollen

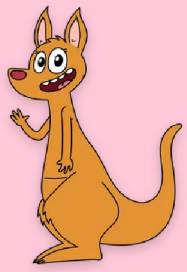
Art © Kevin Coulston

SCIENCE · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–4

How Do Seeds Travel?

Sort nine seeds by how they travel to a new place: wind, water or animals.

Name: _____ **Date:** _____



Plants cannot walk, so their seeds travel to new places to grow. Some **blow in the wind**, some **float on water** and some **ride on animals** or get eaten and dropped far away.

Write each seed under the way it travels.

water lily seed · berry eaten by a bird · coconut · maple "helicopter" · milkweed silk · mangrove pod · burr that sticks to fur · acorn buried by a squirrel · dandelion fluff

Wind	Water	Animals

Invent a seed. How would it travel?

_____

_____

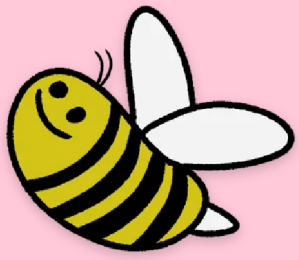
Art © Kevin Coulston

SCIENCE · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–4

How a Bee Pollinates a Flower

Number the five steps of pollination in order, then draw a bee carrying pollen.

Name: _____ **Date:** _____



Pollination is how pollen gets from one flower to another so the flowers can make seeds.

Number the steps from 1 to 5.

- ☐ Pollen sticks to the bee's fuzzy body.
- ☐ The flower can now make seeds.
- ☐ A bee lands on a flower to drink nectar.
- ☐ Some pollen rubs off onto the new flower's pistil.
- ☐ The bee flies to another flower of the same kind.

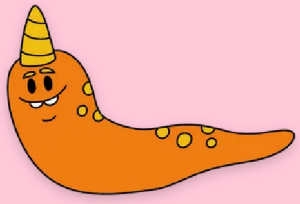
Draw a bee visiting a flower. Show the pollen on the bee.

Art © Kevin Coulston

SCIENCE · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 3–5

How Plants Make Food

Fill in six sentences about photosynthesis, then explain what happens to a plant kept in the dark.



Name: _____ **Date:** _____

Photosynthesis is how a plant makes its own food in its leaves, using light, water and air.

Word bank

carbon dioxide · water · sunlight · chlorophyll · sugar · oxygen

1. Fill in the blanks.

1. Leaves take in _____ from the air through tiny holes.
2. Roots take in _____ from the soil.
3. Leaves use energy from _____ to make food.
4. The green color in leaves, _____, catches the light.
5. The food a plant makes is a kind of _____.
6. Plants give off _____, the gas we breathe.

2. Circle the answer.

A plant kept in a dark closet for weeks would

grow better · not be able to make food

Art © Kevin Coulston

SCIENCE · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–5

Open a Bean Seed

Soak a lima bean, open it, label the seed coat, cotyledon and embryo and draw it up close.

Name: _____ **Date:** _____

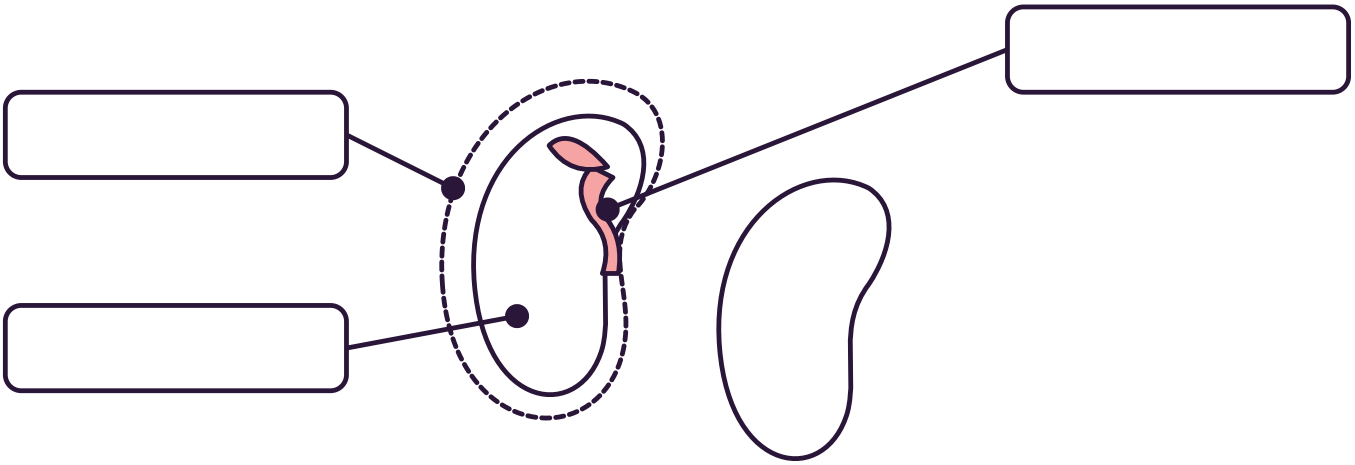


Do it: soak a dry lima bean in water overnight. Gently peel off the thin skin, then split the bean in half with your fingernail. Look closely with a magnifying glass.

Word bank

seed coat | cotyledon | embryo

1. Label the parts of the seed.



2. Draw your seed up close.

3. The embryo is a tiny baby plant. What do you think the cotyledon does for it?

Art © Kevin Coulston

SCIENCE · ANIMAL BABIES AND TRAITS · GRADES K–2

Baby Animal Names

Match eight animals to the names of their babies, from a calf to a joey.



Name: _____ **Date:** _____

Draw a line from each animal to its baby.

cow ●	● duckling
kangaroo ●	● kid
cat ●	● puppy
dog ●	● joey
goat ●	● foal
frog ●	● calf
duck ●	● tadpole
horse ●	● kitten

What is a baby person called?

_____

Art © Kevin Coulston

SCIENCE · ANIMAL BABIES AND TRAITS · GRADES K–2

Does the Baby Look Like Its Parent?

Circle yes or no for eight baby animals, then draw a baby animal and its parent.

Name: _____ **Date:** _____



Does the baby look like its parent? Circle Yes or No.

a kitten and a cat	Yes	No
a caterpillar and a butterfly	Yes	No
a calf and a cow	Yes	No
a tadpole and a frog	Yes	No
a puppy and a dog	Yes	No
a foal and a horse	Yes	No
a grub and a beetle	Yes	No
a baby elephant and its mother	Yes	No

Draw a baby animal and its parent. How are they alike?

Art © Kevin Coulston

SCIENCE · ANIMAL BABIES AND TRAITS · GRADES 3–5

Inherited or Learned?

Sort ten traits and skills into inherited from parents and learned, then name one of each of your own.

Name: _____ **Date:** _____



An **inherited** trait is passed from parents to their young, like eye color. A **learned** skill is something you practice, like riding a bike.

Write each one in the right column.

speaking Spanish · riding a bike · reading a book · curly hair · freckles · a zebra's stripes · a duck's webbed feet · a dog sitting when told · playing the piano · eye color

Inherited	Learned

Name one trait you inherited and one thing you learned.

_____

_____

Art © Kevin Coulston

SCIENCE · ANIMAL BABIES AND TRAITS · GRADES 2–4

Class Traits Survey

Survey your class for six traits, tally the results and tell which trait was the most common.



Name: _____ **Date:** _____

How to do it: ask each classmate about each trait. Make a tally mark in the yes column or the no column.

Trait	Yes (tally)	No (tally)	Total yes
Dimples			
Freckles			
Curly or wavy hair			
Brown eyes			
Left-handed			
Can whistle			

The most common trait was _____

The least common trait was _____

Which one on the list is learned, not inherited?

_____

Art © Kevin Coulston

SCIENCE · ANIMAL BABIES AND TRAITS · GRADES 1–3

Who Takes Care of the Babies?

Sort ten animals into the ones whose parents care for their babies and the ones whose babies are on their own.

Name: _____ **Date:** _____



Write each animal in the right column.

salmon · sea turtle · garter snake · elephant · penguin · robin · wolf · ladybug · monarch butterfly · kangaroo

Parents take care of the babies	The babies are on their own

How do grown-ups take care of you?

_____

_____

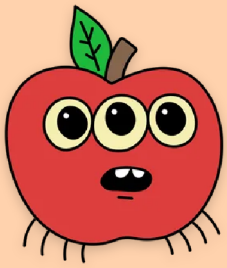
Art © Kevin Coulston

SCIENCE · FOOD GROUPS AND HEALTHY EATING · GRADES 1–3

The Five Food Groups

Write fifteen foods under fruits, vegetables, grains, protein and dairy.

Name: _____ **Date:** _____



Write each food under its food group.

bread · eggs · strawberries · cheese · rice · fish · carrot · banana · chicken · broccoli · peas · pasta · milk · yogurt · apple

Fruits	Vegetables	Grains	Protein	Dairy

Which food group do you eat the most?

_____

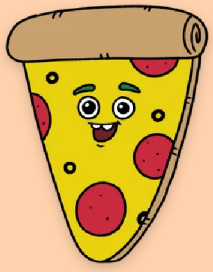
Art © Kevin Coulston

SCIENCE · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

My Healthy Plate

Label the five food groups on the plate and cup, then draw a healthy lunch of your own.

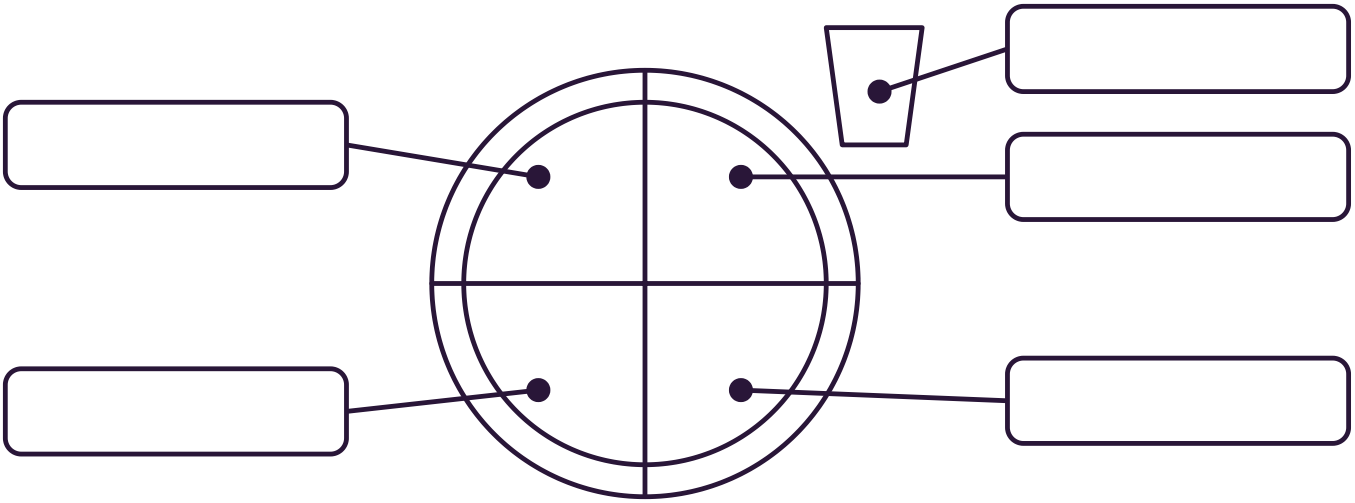
Name: _____ **Date:** _____



Word bank

fruits | vegetables | grains | protein | dairy

Label each part of the plate and the cup.



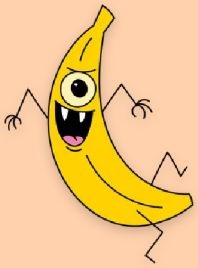
Draw a healthy lunch with a food from every group.

Art © Kevin Coulston

SCIENCE · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

Everyday or Sometimes Foods?

Color the everyday foods and put an X on the sometimes foods, then name your favorite of each.



Name: _____ **Date:** _____

Color the everyday foods. Put an X on the sometimes foods.

apple	candy	carrots	soda
milk	chips	water	cupcake
yogurt	cookies	oatmeal	eggs

My favorite everyday food _____ **My favorite sometimes food** _____

Art © Kevin Coulston

SCIENCE · FOOD GROUPS AND HEALTHY EATING · GRADES 4–5

Read a Food Label

Read the Nutrition Facts on a box of cereal, then answer eight questions, two with a little math.

Name: _____ **Date:** _____



Nutrition Facts

10 servings per box

Serving size	**1 cup**
Calories	**120**
Total fat	1.5 g
Sodium	160 mg
Total carbohydrate	25 g
Dietary fiber	3 g
Total sugars	6 g
Protein	3 g

Circle the answer.

In one serving, there is more

(sugar) (protein)

Foods with 5 g of fiber or more are high in fiber. Is this cereal high in fiber?

(yes) (no)

Read the cereal label. Answer the questions.

1. How big is one serving? _____

2. How many servings are in the box? _____

3. How many calories are in one serving? _____

4. How many grams of sugar are in one serving? _____

5. You eat 2 cups. How many calories is that? _____

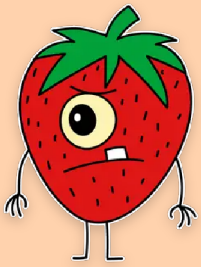
6. How many calories are in the whole box? _____

Art © Kevin Coulston

SCIENCE · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

Food from Plants or Animals?

Cut out twelve foods and glue each one under the plant or the animal it comes from.



Name: _____ **Date:** _____

Glue each food under where it comes from.

From a plant	From an animal

✂ Cut out the cards on the dashed lines.

apple	potato	popcorn	peanut butter	eggs	cheese
chicken	bread	fish	milk	rice	honey

Art © Kevin Coulston

SCIENCE · LANDFORMS AND EROSION · GRADES 2–4

Landforms

Label a mountain, valley, river, lake, island and plain on a picture, then draw the landform near you.

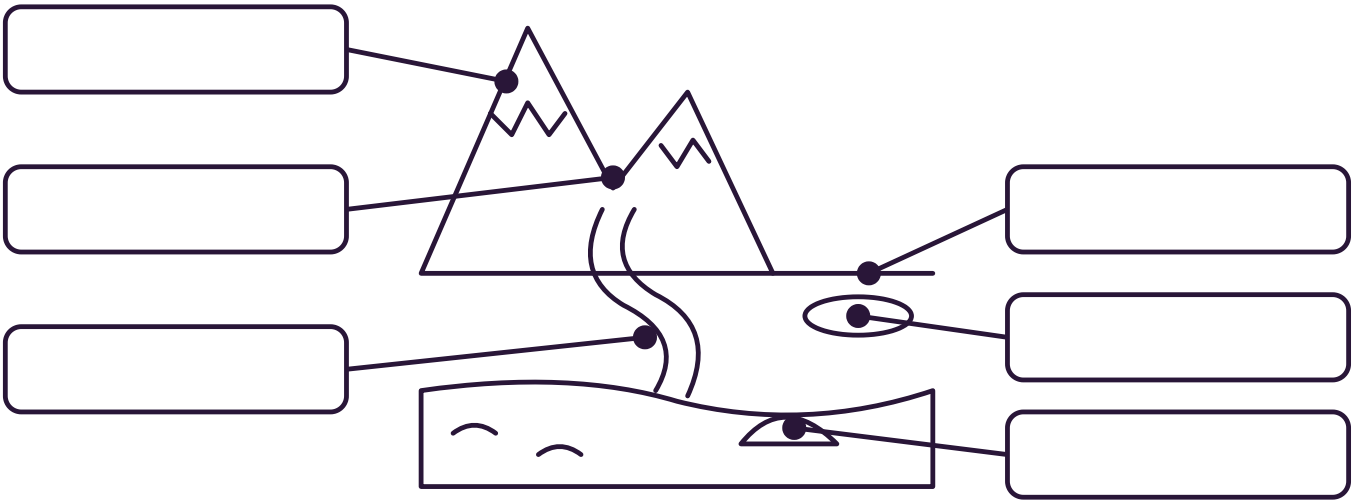


Name: _____ **Date:** _____

Word bank

mountain | valley | river | lake | island | plain

Write the name of each landform.



Draw a landform near where you live. Write its name.

Art © Kevin Coulston

SCIENCE · LANDFORMS AND EROSION · GRADES 3–5

More Landform Words

Match peninsula, canyon, plateau, delta, glacier and dune to their meanings.

Name: _____ **Date:** _____



Draw a line from each word to its meaning.

peninsula ●	● land built from mud and sand where a river meets the sea
canyon ●	● high land that is flat on top
plateau ●	● a huge sheet of ice that moves very slowly
delta ●	● a hill of sand piled up by the wind
glacier ●	● land with water on three sides
dune ●	● a deep valley with steep sides, carved by a river

Which of these landforms would you most like to visit? Why?

Art © Kevin Coulston

SCIENCE · LANDFORMS AND EROSION · GRADES 3–5

Weathering or Erosion?

Sort ten changes into weathering (breaking rock) and erosion (moving it), then explain the difference.



Name: _____ **Date:** _____

Weathering breaks rock into smaller pieces. **Erosion** carries the pieces away to a new place. Water, wind, ice and plants can do both.

Write each change in the right column.

- wind piles sand into dunes
- a river carries sand downstream
- waves wash beach sand away
- tree roots crack a sidewalk
- rain slowly wears away a stone statue
- blowing sand scratches a rock
- a rock cracks from hot days and cold nights
- a glacier drags rocks down a valley
- a landslide moves dirt down a hill
- water freezes in a crack and splits a rock

Weathering (breaking)	Erosion (moving)

In your own words, how are weathering and erosion different?

_____

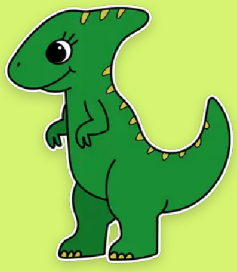
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Art © Kevin Coulston

SCIENCE · LANDFORMS AND EROSION · GRADES 2–5

Erosion Experiment

Pour water on bare soil and on soil with plants, compare how much washes away and explain how plants help.



Name: _____ **Date:** _____

You need: 2 trays or boxes, soil, a patch of grass (or a thick layer of leaves), a cup with holes poked in the bottom and water. **Do it:** fill both trays with soil and put the grass on one. Tilt both trays the same way. Pour one cup of water over each.

I predict the most soil will wash off the tray with _____

Tray	How much soil washed away? (a lot, some, a little)	What the water looked like
Bare soil		
Soil with grass		

Draw both trays after the water.

How do plants help stop erosion?

Art © Kevin Coulston

SCIENCE · LANDFORMS AND EROSION · GRADES 2–4

Fast or Slow Changes?

Sort eight changes to Earth's surface into fast and slow, then draw one.

Name: _____ **Date:** _____



Write each change to Earth's surface in the right column.

a river carving a canyon | a glacier carving a valley | a landslide | a volcano erupting | a flood | mountains wearing down | waves shaping a rocky cliff | an earthquake

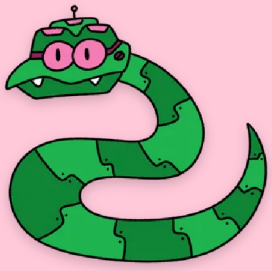
Fast (minutes, hours or days)	Slow (hundreds of years or more)

Draw one fast change and one slow change.

Art © Kevin Coulston

SCIENCE · VOLCANOES AND EARTHQUAKES · GRADES 2–5

Parts of a Volcano



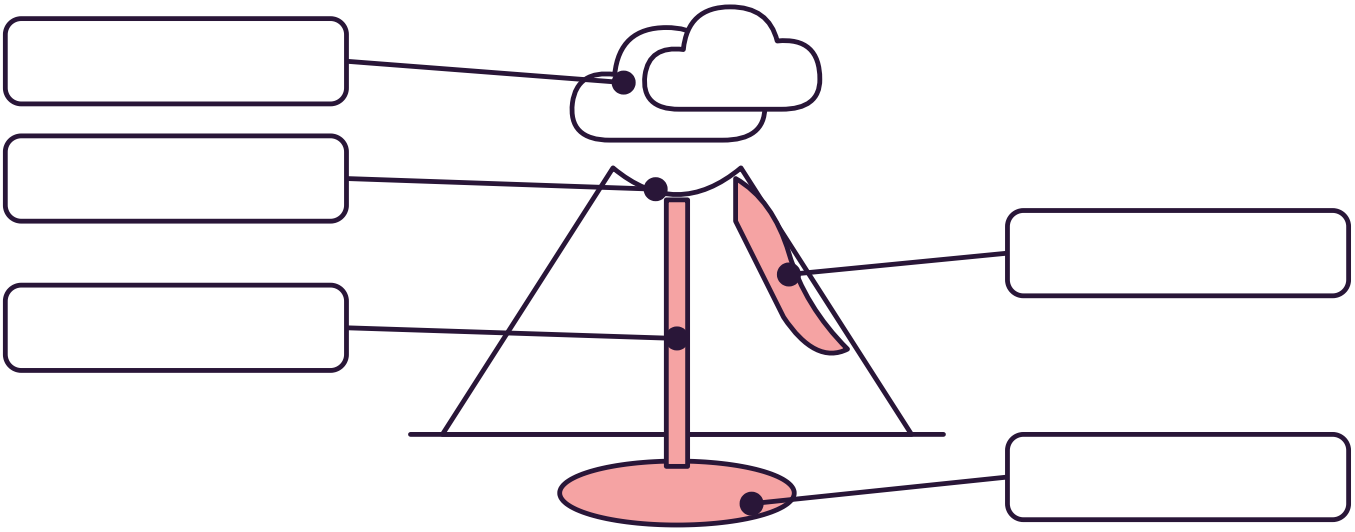
Label the ash cloud, crater, vent, lava and magma chamber, then fill in three sentences about magma and lava.

Name: _____ **Date:** _____

Word bank

ash cloud | crater | vent | lava | magma chamber | magma | rock

1. Label the volcano.



2. Fill in the blanks.

1. Melted rock under the ground is called _____.
2. When melted rock comes out of a volcano, it is called _____.
3. When lava cools, it hardens into _____.

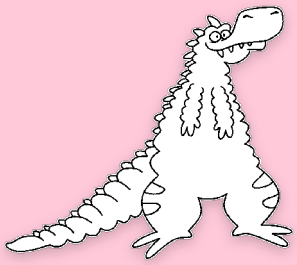
Art © Kevin Coulston

SCIENCE · VOLCANOES AND EARTHQUAKES · GRADES 2–5

Volcanoes: True or False?

Eight volcano facts to mark true or false, then fix two false ones.

Name: _____ **Date:** _____



Circle True or False.

Magma is melted rock under the ground.	True	False
Lava is magma that reaches the surface.	True	False
Every volcano is erupting right now.	True	False
Some volcanoes are under the ocean.	True	False
The Hawaiian Islands were made by volcanoes.	True	False
Volcanic ash is soft and fluffy like smoke.	True	False
Mount Everest is a volcano.	True	False
Scientists who study volcanoes are called volcanologists.	True	False

Pick two false sentences and fix them so they are true.

_____

_____

_____

Art © Kevin Coulston

SCIENCE · VOLCANOES AND EARTHQUAKES · GRADES 1–4

Earthquake Safety



Color the safe choices and put an X on the unsafe ones, then find the safest spot in your classroom.

Name: _____ **Date:** _____

When the ground shakes: **Drop** to your hands and knees, **Cover** your head and neck, and **Hold On** until the shaking stops.

Color the safe choices. Put an X on the unsafe ones.

drop to your hands and knees	run outside while it shakes	cover your head and neck
ride in an elevator	hold on to a sturdy desk	stand next to a tall bookcase
stay away from windows	stand at a window to watch	stay put until the shaking stops

Where is the safest place in your classroom to drop, cover and hold on?

_____

_____

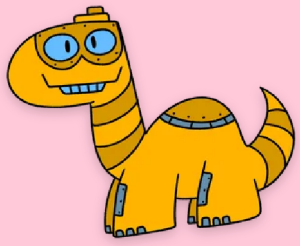
Art © Kevin Coulston

SCIENCE · VOLCANOES AND EARTHQUAKES · GRADES 4–5

Earth's Moving Plates

Fill in six sentences about plates, earthquakes, mountains and the Ring of Fire, then answer two questions.

Name: _____ **Date:** _____



Earth's crust is cracked into giant pieces called **plates**. They float on hot, soft rock and move all the time, a tiny bit each year.

Word bank

plates · slowly · earthquake · mountains · volcanoes · Ring of Fire

1. Fill in the blanks.

1. Earth's crust is broken into huge pieces called _____.
2. They move very _____, about as fast as your fingernails grow.
3. When two plates slip suddenly, the ground shakes in an _____.
4. Plates pushing together for millions of years can build _____.
5. Melted rock can rise up where plates meet and make _____.
6. Many volcanoes circle the Pacific Ocean in the _____.

2. Circle the answer.

Which tool measures earthquakes?

seismograph · thermometer · rain gauge

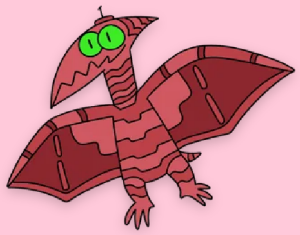
Are the plates moving right now?

yes · no

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SCIENCE · VOLCANOES AND EARTHQUAKES · GRADES 1–5

Baking Soda Volcano



An experiment: change the amount of vinegar, record how long the volcano bubbles and explain what made the bubbles.

Name: _____ **Date:** _____

You need: a cup on a tray, baking soda, vinegar, a spoon, a measuring cup, dish soap and safety goggles. **Do it:** put 2 spoonfuls of baking soda and a drop of dish soap in the cup. Pour in the vinegar and time the bubbles. Wash out the cup and try again with more vinegar.

I predict that more vinegar will _____

Try	Baking soda	Vinegar	How long it bubbled (seconds)	How high it rose
1				
2				
3				

What happened when you used more vinegar?

_____

_____

The bubbles are a gas. Where do you think the gas came from?

_____

_____

Art © Kevin Coulston

SCIENCE · HEAT AND TEMPERATURE · GRADES K–2

Hot or Cold?

Cut out ten cards and glue each one under hot or cold.

Name: _____ **Date:** _____



Glue each card under hot or cold.

Hot	Cold

✂ **Cut out the cards on the dashed lines.**

a campfire	hot cocoa	soup	ice cream	a freezer
an ice cube	an oven	a popsicle	snow	the sun

Art © Kevin Coulston

SCIENCE · HEAT AND TEMPERATURE · GRADES 1–3

What Gives Off Heat?

Color the seven things that give off heat, X the five that do not, then fill in a sentence about friction.



Name: _____ **Date:** _____

Color the 7 things that give off heat. Put an X on the 5 that do not.

the sun	an ice cube	a campfire	a snowball
a stove	a toaster	a glass of cold water	a hair dryer
your body	a book	rubbing your hands together	a frozen pea

Word bank

friction · heat · sun

1. Our biggest source of heat is the _____.

2. Rubbing your hands together makes them warm because of _____.

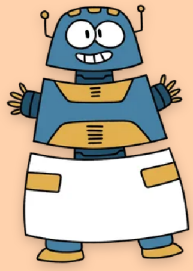
3. A stove gives off _____ to cook food.

Art © Kevin Coulston

SCIENCE · HEAT AND TEMPERATURE · GRADES 3–5

Which Spoon Gets Warm?

An experiment: put metal, plastic and wooden spoons in warm water and find out which carries heat best.



Name: _____ **Date:** _____

You need: a mug of hot tap water (a grown-up pours it), a metal spoon, a plastic spoon, a wooden spoon and a tiny dab of butter for each handle. **Do it:** stick a dab of butter near the top of each handle. Stand the spoons in the water and watch which butter melts first.

Spoon	My prediction: 1st, 2nd or 3rd to melt	Minutes until the butter slid	Order it melted
Metal			
Plastic			
Wood			

Which spoon carried heat the best? It is a good heat conductor.

Why do many pots have plastic or wooden handles?

Art © Kevin Coulston

SCIENCE · HEAT AND TEMPERATURE · GRADES 3–5

Keep It Cold Challenge

Wrap ice cubes in foil, cloth, newspaper and nothing, check them every 15 minutes and find the best insulator.



Name: _____ **Date:** _____

An insulator slows down heat. Wrap four same-size ice cubes: one in foil, one in a sock, one in newspaper and one in nothing. Put them on plates in the same warm spot and check every 15 minutes.

I predict the ice cube that lasts longest will be wrapped in _____

Write: solid, half melted or all water.

Time	Foil	Sock	Newspaper	Nothing
Start				
15 min				
30 min				
45 min				
60 min				

Which was the best insulator? How could you use it to keep your lunch cold?

_____

_____

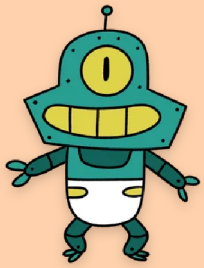
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SCIENCE · HEAT AND TEMPERATURE · GRADES 4–5

Conduction, Convection or Radiation?

Learn the three ways heat moves, then sort nine examples.

Name: _____ **Date:** _____



Heat moves in three ways. **Conduction:** heat moves through things that touch. **Convection:** warm air or water rises and moves around. **Radiation:** heat travels through space as rays, like sunshine.

Write each example in the right column.

- a hot air balloon rising
- warming your hands near a campfire
- warm air rising from a heater
- touching a hot pan
- an ice cube melting in your hand
- water swirling as it boils in a pot
- feeling the sun warm your face
- a heat lamp keeping chicks warm
- a spoon heating up in hot soup

Conduction	Convection	Radiation

Which way does heat get from the sun to Earth?

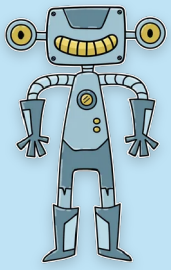
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SCIENCE · ENERGY · GRADES 3–5

Forms of Energy

Match light, sound, heat, electrical, motion and chemical energy to an example of each.



Name: _____ **Date:** _____

Draw a line from each form of energy to an example.

light energy ●	● a drum being played
sound energy ●	● a ball rolling across the floor
heat energy ●	● a flashlight shining in the dark
electrical energy ●	● food in your lunchbox
motion energy ●	● a warm stove
chemical energy ●	● a cord powering a TV

Name two forms of energy you used this morning.

_____

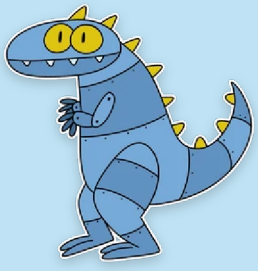
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SCIENCE · ENERGY · GRADES 3–5

Potential or Kinetic Energy?

Sort ten examples into stored (potential) energy and moving (kinetic) energy.



Name: _____ **Date:** _____

Potential energy is stored energy, waiting to be used. **Kinetic energy** is the energy of something moving.

Write each example in the right column.

a running dog | a ball rolling down a hill | falling rain | a stretched rubber band | a book on a high shelf | a roller coaster at the very top | a pulled-back bow and arrow | wind blowing | a moving car | a ball at the top of a hill

Potential (stored)	Kinetic (moving)

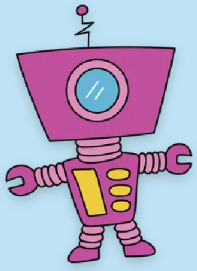
When does a swing have the most potential energy? When does it have the most kinetic energy?

Art © Kevin Coulston

SCIENCE · ENERGY · GRADES 4–5

Energy Changes

Fill in six sentences about energy changing form, from a toaster to a solar panel.



Name: _____ **Date:** _____

Energy is never used up. It changes from one form to another.

Word bank

heat · light · sound · motion · electrical

Fill in the blanks. You can use a word more than once.

1. A toaster changes electrical energy into _____ energy.
2. A flashlight changes the stored energy in its batteries into _____ energy.
3. Hitting a drum changes motion energy into _____ energy.
4. A solar panel changes sunlight into _____ energy.
5. A fan changes electrical energy into _____ energy.
6. A campfire changes the stored energy in wood into heat and _____.

Think of one more thing that changes energy. What does it change?

_____

_____

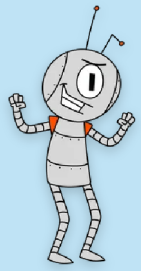
Art © Kevin Coulston

SCIENCE · ENERGY · GRADES 3–5

Bouncing Ball Experiment

Drop a ball from four heights, measure each bounce three times and explain where the energy goes.

Name: _____ **Date:** _____



You need: a bouncy ball, a meter stick taped to a wall and a partner. **Do it:** drop the ball (do not throw it) from each height. Your partner watches how high it bounces.

Drop height	Bounce 1 (cm)	Bounce 2 (cm)	Bounce 3 (cm)	Highest
25 cm				
50 cm				
75 cm				
100 cm				

What happens to the bounce when you drop the ball from higher up?

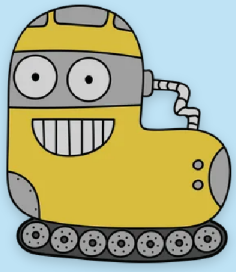
The ball never bounces as high as you dropped it. Where does some of the energy go?

Art © Kevin Coulston

SCIENCE · ENERGY · GRADES 3–5

Energy Hunt at Home

Find the things that use electricity in each room at home and plan how your family could use less.



Name: _____ **Date:** _____

List the things that use electricity in each room.

Room	Things that use electricity	How could we use less?
Kitchen		
Living room		
Bedroom		
Bathroom		
Garage or yard		

Things I found in all _____ **Room with the most** _____

Our family plan to save energy:

1. _____
2. _____
3. _____

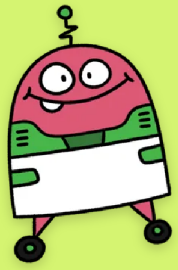
Art © Kevin Coulston

SCIENCE · MIXTURES AND CHANGES · GRADES 2–5

Will It Dissolve?

An experiment: predict and test whether seven things dissolve in water.

Name: _____ **Date:** _____



Do it: fill seven clear cups with warm water. Stir one spoonful of a different thing into each cup for one minute, then look. If you cannot see it any more, it **dissolved**.

What I stirred in	I predict it will dissolve: yes or no	Did it dissolve?
salt		
sugar		
sand		
pepper		
flour		
drink mix powder		
rice		

Where did the things that dissolved go?

Art © Kevin Coulston

SCIENCE · MIXTURES AND CHANGES · GRADES 3–5

Mixture or Solution?

Sort ten examples into mixtures and solutions.

Name: _____ **Date:** _____



In a **mixture**, you can still see the different parts and pick them apart. A **solution** is a mixture where one thing dissolves into another so evenly you cannot see it any more.

Write each one in the right column.

lemonade | salt water | drink mix in water | a salad | sand and water | cereal and milk | beads and buttons | sugar stirred into tea | vinegar | trail mix

Mixture	Solution

How could you get the salt back out of salt water?

Art © Kevin Coulston

SCIENCE · MIXTURES AND CHANGES · GRADES 3–5

Physical or Chemical Change?

Sort ten changes into physical changes and chemical changes, then explain one.



Name: _____ **Date:** _____

A **physical change** changes how something looks, but it is still the same stuff, like cutting paper. A **chemical change** makes a brand new substance, like a cake baking.

Write each change in the right column.

burning wood · baking a cake · frying an egg · melting ice · crushing a can · dissolving sugar in water · folding a shirt · a bike chain rusting · a banana turning brown · cutting paper

Physical change	Chemical change

Pick one chemical change. How do you know a new substance was made?

_____

_____

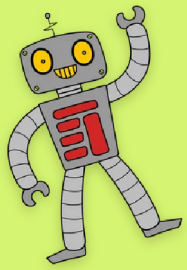
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SCIENCE · MIXTURES AND CHANGES · GRADES 3–5

Separate a Mixture

Match five tools to how they separate a mix of sand, salt, rice and paper clips, then put the steps in order.

Name: _____ **Date:** _____



Someone mixed **sand, salt, rice and steel paper clips** in one jar. Scientists separate mixtures by using what is different about each part.

1. Draw a line from each tool to its job.

magnet ●	● catches the rice and lets the sand and salt fall through
strainer ●	● pulls out the steel paper clips
water ●	● catches the sand and lets the salty water through
coffee filter ●	● dries up the water and leaves the salt behind
sunny window ●	● dissolves the salt

2. Number the steps in order.

☐ Stir the sand and salt into water.

☐ Use the magnet to pull out the paper clips.

☐ Set the salty water in the sun until the water is gone.

☐ Pour the rest through a strainer to catch the rice.

☐ Pour the water through a coffee filter to catch the sand.

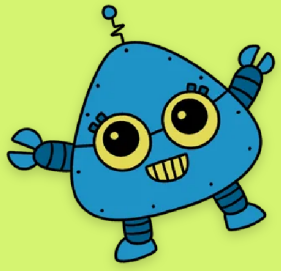
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SCIENCE · MIXTURES AND CHANGES · GRADES 4–5

Chemistry Words

Match mixture, solution, dissolve, physical change, chemical change and evaporate to their meanings.

Name: _____ **Date:** _____



Draw a line from each word to its meaning.

mixture	to break up and spread out in a liquid
solution	two or more things put together that keep their own properties
dissolve	a change that makes a new substance
physical change	a mixture where one thing dissolves evenly in another
chemical change	to change from a liquid into a gas
evaporate	a change in size, shape or state, not a new substance

Use two of the words in a sentence about cooking.

_____

_____

Art © Kevin Coulston

SCIENCE · SINK OR FLOAT · GRADES K–2

Sink or Float: Predict and Test

Guess whether eight objects will sink or float, test them in a tub of water and check your guesses.



Name: _____ **Date:** _____

Do it: fill a tub with water. Guess first, then gently set each object on the water and watch.

Object	My guess: sink or float?	What it did	Was I right?
a coin	☐ sink ☐ float		
a leaf	☐ sink ☐ float		
a cork	☐ sink ☐ float		
a rock	☐ sink ☐ float		
a sponge	☐ sink ☐ float		
a spoon	☐ sink ☐ float		
a toy block	☐ sink ☐ float		
an apple	☐ sink ☐ float		

How many did you guess right? _____

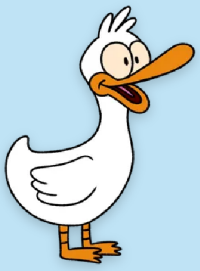
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SCIENCE · SINK OR FLOAT · GRADES K–2

Sink or Float Sort

Cut out ten cards and glue each one under sinks or floats.

Name: _____ **Date:** _____



Glue each card under sinks or floats.

Sinks	Floats

✂ **Cut out the cards on the dashed lines.**

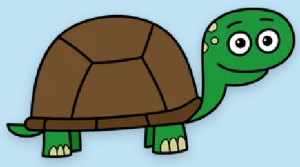
a coin	a leaf	a key	a rubber duck	an apple
a cork	a marble	a feather	a rock	a metal spoon

Art © Kevin Coulston

SCIENCE · SINK OR FLOAT · GRADES 2–5

Clay Boat Challenge

An engineering challenge: shape clay into a boat that floats and holds as many pennies as it can.



Name: _____ **Date:** _____

The challenge: a ball of clay sinks. Can you change its shape so it floats and carries cargo? **You need:** a ball of clay the size of a golf ball, a tub of water and pennies.

1. Ask

Why does the ball of clay sink?

2. Plan

Draw your boat shape.

3. Test

How many pennies did it hold?

Boat	What shape I made	Pennies it held
1		
2		
3		

What shape held the most pennies? Why do you think it worked?

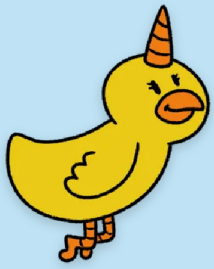
Art © Kevin Coulston

SCIENCE · SINK OR FLOAT · GRADES 1–3

Floating: True or False?

Seven facts about sinking and floating to mark true or false, then explain how a heavy ship floats.

Name: _____ **Date:** _____



Circle True or False.

Heavy things always sink.	True	False
Changing an object's shape can change whether it floats.	True	False
Things float more easily in salt water.	True	False
Air inside something can help it float.	True	False
All metal things sink.	True	False
Most wood floats.	True	False
An apple floats in water.	True	False

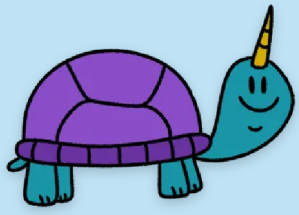
A huge steel ship weighs more than a car. How can it float?

Art © Kevin Coulston

SCIENCE · SINK OR FLOAT · GRADES 3–5

Liquid Density Tower

Pour honey, dish soap, water and oil into a cup, number the layers from bottom to top and draw your tower.



Name: _____ **Date:** _____

You need: a tall clear cup, honey, dish soap, water (with a drop of food coloring) and vegetable oil.
Do it: slowly pour the same amount of each liquid into the cup, one at a time, down the side. Wait and watch. Heavier (denser) liquids sink to the bottom.

1. Write 1 for the bottom layer up to 4 for the top layer.

☐ water

☐ honey

☐ vegetable oil

☐ dish soap

2. Draw and color your tower. Label each layer.

3. Why do you think the liquids stay in layers?

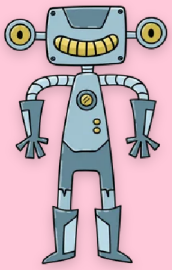
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SCIENCE · ENGINEERING DESIGN · GRADES 2–4

The Engineering Design Process

Number the five steps engineers use, from ask to improve, then name a problem an engineer could solve.

Name: _____ **Date:** _____



Engineers solve problems by designing things. They follow these steps, and they go around again and again until the design works well.

1. Number the steps from 1 to 5.

- ☐ Create: build your design.
- ☐ Ask: what is the problem? What do I need?
- ☐ Improve: test it, then make it better.
- ☐ Plan: draw your best idea and list the materials.
- ☐ Imagine: think of lots of ideas.

2. Think of a problem at school. What could an engineer design to fix it?

_____

_____

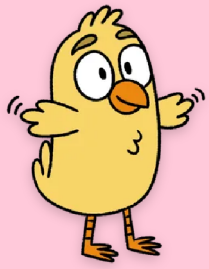
3. Draw your idea.

Art © Kevin Coulston

SCIENCE · ENGINEERING DESIGN · GRADES 3–5

Egg Drop Challenge

Plan, build and test a package that keeps an egg from breaking when it falls.



Name: _____ **Date:** _____

The challenge: build a package that keeps a raw egg from breaking when it is dropped from 2 meters. **Rules:** use only paper, straws, tape, cotton balls, rubber bands and a paper cup.

Materials I will use: ☐ paper ☐ straws ☐ tape ☐ cotton balls ☐ rubber bands ☐ paper cup

Draw your design. Label the parts.

Drop	Height	Did the egg break?	What I will change
1			
2			
3			

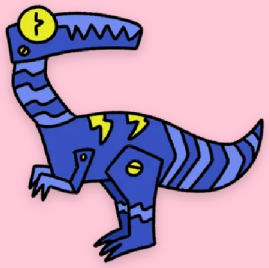
What part of your design protected the egg the most?

Art © Kevin Coulston

SCIENCE · ENGINEERING DESIGN · GRADES 3–5

Craft Stick Catapult

Build a catapult from craft sticks and rubber bands, launch a pom-pom and measure how far it flies.



Name: _____ **Date:** _____

Build it: stack 5 craft sticks and wrap a rubber band around each end. Band 2 more sticks together at one end only. Open them gently, slide the stack between them and glue a bottle cap to the free end of the top stick. **Test it:** put a pom-pom in the cap, press down and let go.

How far I pressed down	Try 1 (cm)	Try 2 (cm)	Try 3 (cm)
A little			
Halfway			
All the way			

My longest launch _____

One change I will try next _____

What made the pom-pom fly farther? What kind of simple machine is a catapult?

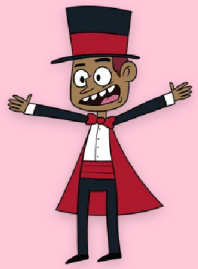
Art © Kevin Coulston

SCIENCE · ENGINEERING DESIGN · GRADES 3–5

Kinds of Engineers

Match six kinds of engineers to what they design, then tell which one you would like to be.

Name: _____ **Date:** _____



Draw a line from each engineer to what they design.

civil engineer ●	● tools that help doctors and patients
aerospace engineer ●	● circuits and power lines
mechanical engineer ●	● ways to keep water and air clean
electrical engineer ●	● airplanes and rockets
biomedical engineer ●	● bridges, roads and buildings
environmental engineer ●	● machines and engines

Which kind of engineer would you like to be? What would you design?

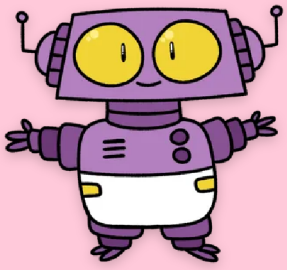
_____

_____

Art © Kevin Coulston

SCIENCE · ENGINEERING DESIGN · GRADES 2–5

Paper Marble Run



Build a marble run from paper and tape that makes the marble roll as slowly as it can, then improve it.

Name: _____ **Date:** _____

The challenge: build a marble run on a wall or a cardboard box that makes a marble take as long as it can to reach the bottom. **You need:** paper, cardboard tubes, tape, scissors, a marble and a stopwatch.

Plan: draw your marble run. Add turns, ramps and drops.

Try	Time (seconds)	What I changed
1		
2		
3		

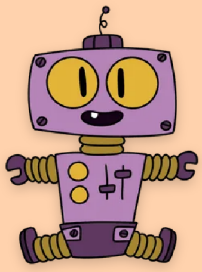
What slowed the marble down the most?

Art © Kevin Coulston

SCIENCE · CODING UNPLUGGED · GRADES 1–3

Code the Robot

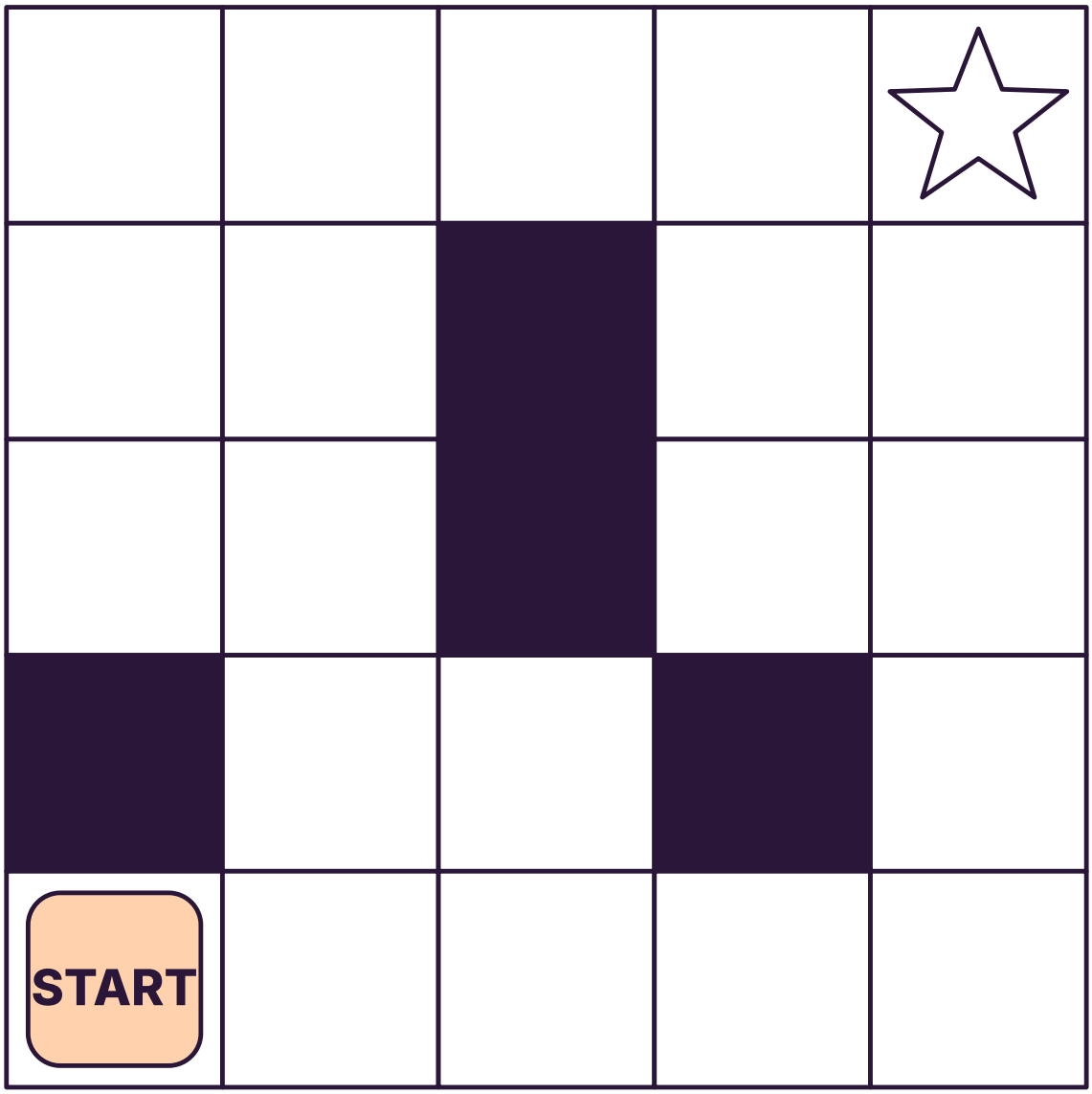
Write the arrows that move the robot from start to the star on a grid.



Name: _____ **Date:** _____

Computers follow code one step at a time. Each arrow moves the robot **one square**: ↑ up, ↓ down, ← left, → right.

Write the arrows that take the robot from START to the star. Do not go through the dark squares.



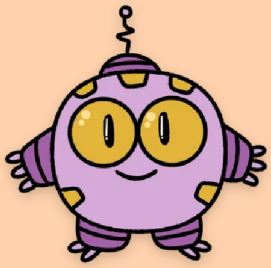
1	2	3	4	5	6	7	8

Art © Kevin Coulston

SCIENCE · CODING UNPLUGGED · GRADES 2–4

Robot Maze

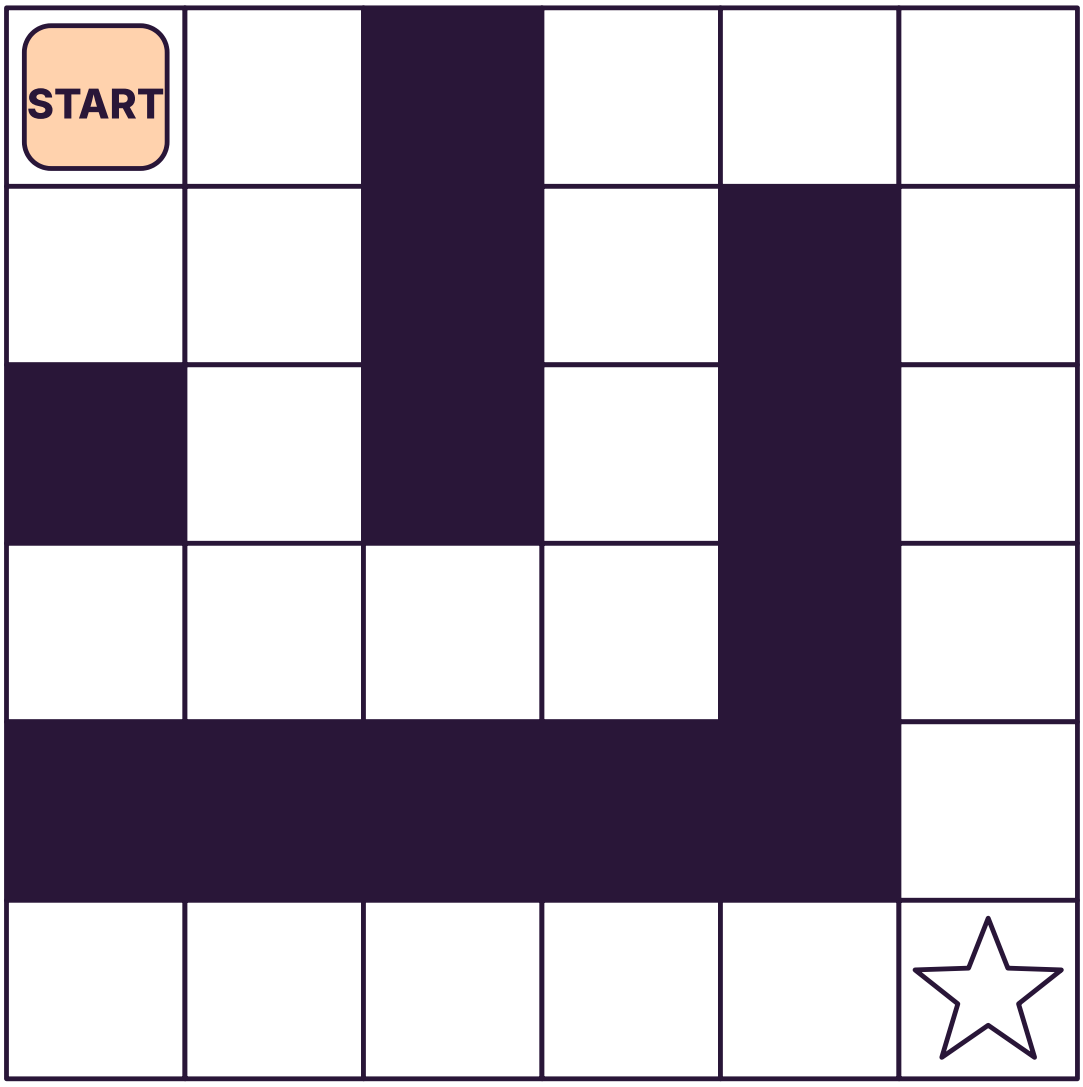
Write the code that takes the robot around the walls of a maze to the star.



Name: _____ **Date:** _____

Each arrow moves the robot **one square**: ↑ up, ↓ down, ← left, → right. The robot cannot go through walls.

Write the code to get the robot through the maze to the star.



1 2 3 4 5 6 7 8 9 10 11 12 13

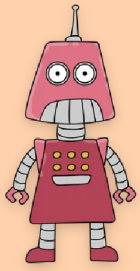
14 15 16

Art © Kevin Coulston

SCIENCE · CODING UNPLUGGED · GRADES K–2

Put the Algorithm in Order

Number the steps of two everyday algorithms, brushing your teeth and planting a seed.



Name: _____ **Date:** _____

An **algorithm** is a list of steps in the right order. A computer needs every step, in order, to do a job.

1. Brushing your teeth: number the steps from 1 to 6.

- ☐ Spit into the sink.
- ☐ Pick up your toothbrush.
- ☐ Put the toothbrush away.
- ☐ Brush the top and bottom teeth.
- ☐ Squeeze toothpaste onto the brush.
- ☐ Rinse the toothbrush.

2. Planting a seed: number the steps from 1 to 4.

- ☐ Water it.
- ☐ Dig a small hole.
- ☐ Cover the seed with soil.
- ☐ Drop in a seed.

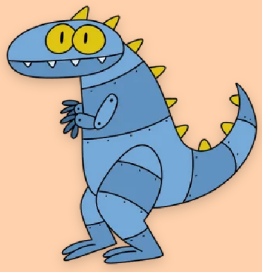
Art © Kevin Coulston

SCIENCE · CODING UNPLUGGED · GRADES 2–5

Find the Bug

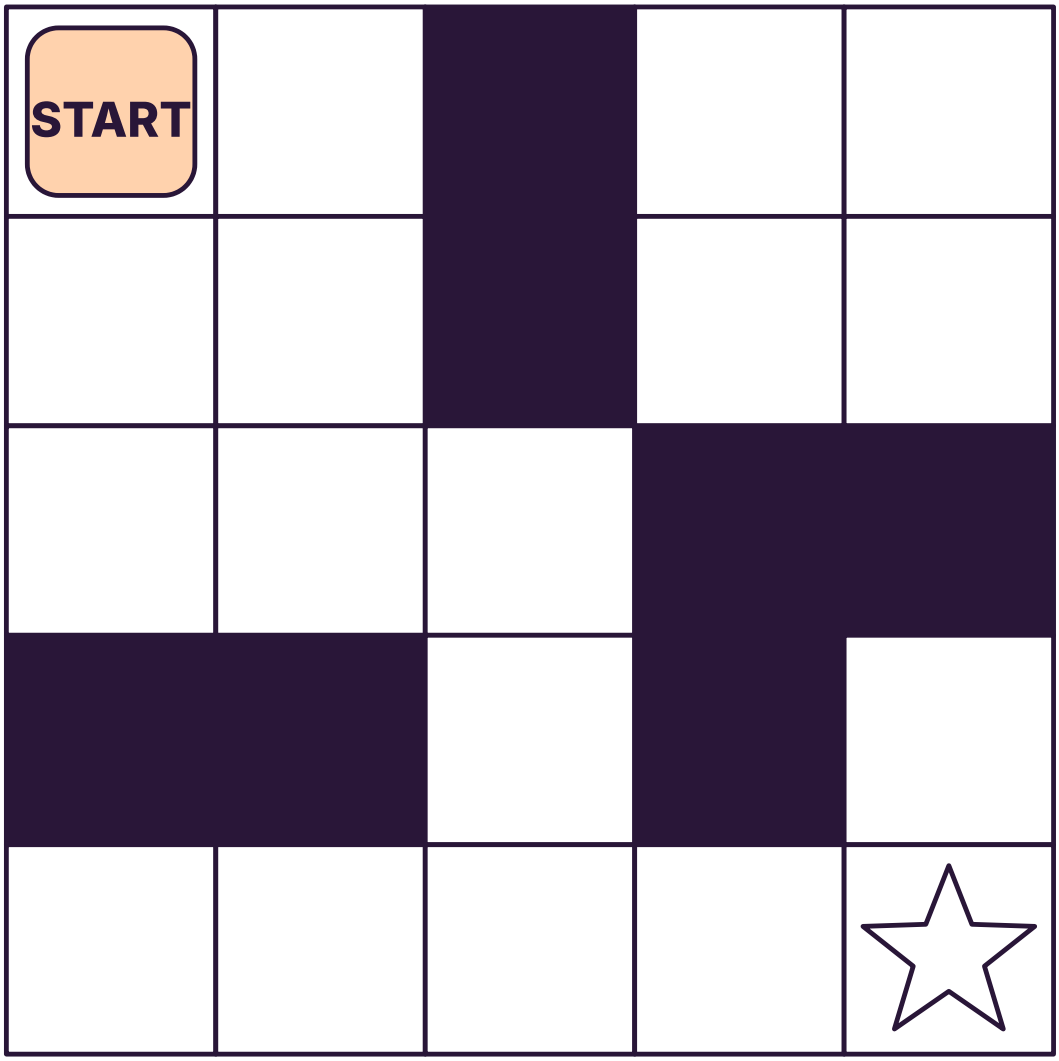
The robot's code has one wrong arrow. Follow it, find the bug and fix it.

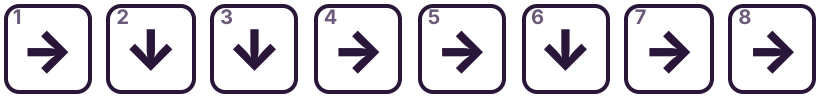
Name: _____ **Date:** _____



A mistake in code is called a **bug**. Fixing it is called **debugging**. Follow this code with your finger. One arrow sends the robot the wrong way.

Follow the code from START. Find the step that goes wrong.





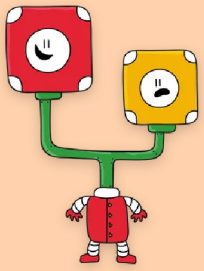
The bug is in step number _____ **The arrow should be** _____

Art © Kevin Coulston

SCIENCE · CODING UNPLUGGED · GRADES 3–5

Write Your Name in Binary

Use a code of ones and zeros to decode two words and write your own name the way a computer could.



Name: _____ **Date:** _____

Computers store everything as **1s and 0s**, called **binary code**. In this code, every letter is five 1s and 0s.

Word bank

A 00001	B 00010	C 00011	D 00100	E 00101	F 00110
G 00111	H 01000	I 01001	J 01010	K 01011	L 01100
M 01101	N 01110	O 01111	P 10000	Q 10001	R 10010
S 10011	T 10100	U 10101	V 10110	W 10111	X 11000
Y 11001	Z 11010				

1. Decode the words.

00011 00001 10100 _____

00100 01111 00111 _____

2. Write your first name in binary code, one letter on each line.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Art © Kevin Coulston

SCIENCE · SCIENCE TOOLS AND LAB SAFETY · GRADES 1–4

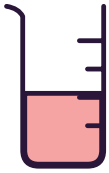
Science Tools

Match a beaker, magnifying glass, ruler, balance, stopwatch and safety goggles to their jobs.

Name: _____ **Date:** _____



Draw a line from each tool to its job.



- protects your eyes



- measures how much time something takes



- makes small things look bigger



- holds, measures and pours liquids



- measures how long something is



- compares how heavy things are

Which tool would you use to time a race?

_____

Art © Kevin Coulston

SCIENCE · SCIENCE TOOLS AND LAB SAFETY · GRADES 1–5

Lab Safety

Color the six safe choices and put an X on the six unsafe ones, then write the rule you think matters most.

Name: _____ **Date:** _____



Color the safe choices. Put an X on the unsafe ones.

wear goggles when your teacher says to	taste what you are testing	tie back long hair
run around the room	wash your hands after an experiment	mix things just to see what happens
tell a grown-up if something spills or breaks	pick up broken glass	follow the steps in order
eat a snack at the science table	clean up when you are done	rub your eyes while you work

The safety rule I think matters most, and why:

_____

_____

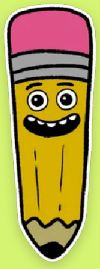
Art © Kevin Coulston

SCIENCE · SCIENCE TOOLS AND LAB SAFETY · GRADES 1–3

Measure with a Ruler

Guess and then measure six things in centimeters and find how close each guess was.

Name: _____ **Date:** _____



Measure it: line up the end of the object with the 0 on your ruler. Read the number where the object ends. Write the answer in centimeters (cm).

Object	My guess (cm)	I measured (cm)	How far off was I?
a pencil			
a crayon			
a glue stick			
my hand			
my shoe			
a book			

Longest thing _____ **Shortest thing** _____

Art © Kevin Coulston

SCIENCE · SCIENCE TOOLS AND LAB SAFETY · GRADES K–3

Which Is Heavier?

Predict which of two things is heavier, test them on a balance and record five pairs.

Name: _____ **Date:** _____





A **balance** compares how heavy things are. Put one object in each pan. The **heavier** side goes **down**. If the pans stay level, the objects weigh the same.

Left pan	Right pan	My guess: which is heavier?	Which was heavier?
a crayon			
an apple			
a pencil			
a glue stick			
a book			

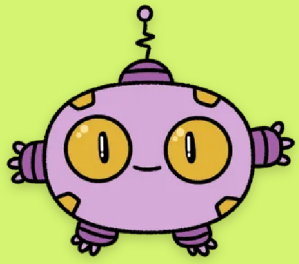
Does the bigger thing always weigh more?

Art © Kevin Coulston

SCIENCE · SCIENCE TOOLS AND LAB SAFETY · GRADES 2–5

Read a Measuring Cylinder

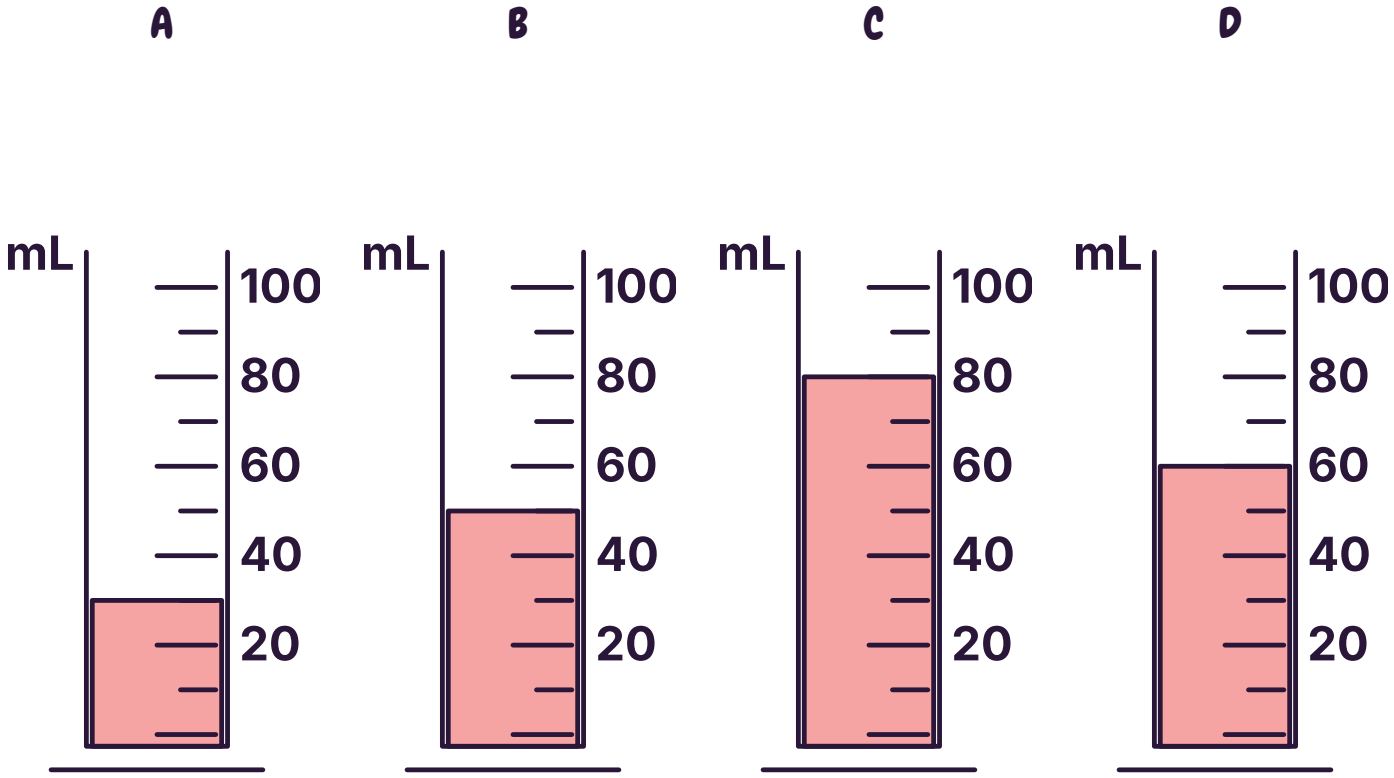
Read the water level in four measuring cylinders in milliliters, then answer three questions.



Name: _____ **Date:** _____

Scientists measure liquids in **milliliters (mL)**. Read the number at the top of the water. Each small line is 10 mL.

1. Write how much water is in each cylinder.



_____ mL _____ mL _____ mL _____ mL

2. Answer the questions.

Which cylinder has the most water? _____

How much more water is in C than in A? _____

If you pour A and B together, how much water is there? _____

Art © Kevin Coulston

ANSWER KEY · SEASONS · GRADES K–2

Answer Key: Seasons Sort

Answers for grown-ups. Some questions have more than one good answer.



Write each one under the season it fits best.

sunscreen · picking apples · rain boots · baby birds hatching · building a snowman · a popsicle on a hot day · a warm coat · planting seeds · a swimsuit · raking leaves · leaves turning orange · mittens

Winter	Spring	Summer	Fall
mittens	rain boots	a swimsuit	raking leaves
building a snowman	planting seeds	sunscreen	picking apples
a warm coat	baby birds hatching	a popsicle on a hot day	leaves turning orange

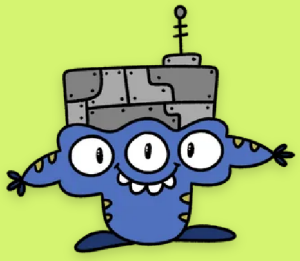
What is your favorite season? Why?

Art © Kevin Coulston

ANSWER KEY · SEASONS · GRADES 2–4

Answer Key: Why Do We Have Seasons?

Answers for grown-ups. Some questions have more than one good answer.



Earth is **tilted**. As it travels around the sun each year, the half of Earth tipped **toward** the sun gets more direct sunlight and longer days: it has **summer**. The half tipped **away** from the sun has **winter**.

Circle True or False.

Earth takes one year to travel around the sun.	**True**	False
We have summer because Earth gets much closer to the sun.	True	**False**
Earth is tilted.	**True**	False
When it is summer in the United States, it is winter in Australia.	**True**	False
Summer days have more hours of daylight than winter days.	**True**	False
Every place on Earth has four very different seasons.	True	**False**
In winter, sunlight hits the ground at a low slant.	**True**	False

Pick one false sentence and fix it so it is true.

Art © Kevin Coulston

ANSWER KEY · SEASONS · GRADES 1–3

Answer Key: Animals in Winter

Answers for grown-ups. Some questions have more than one good answer.



Animals get ready for winter in different ways. Some **hibernate**: they sleep deeply all winter. Some **migrate**: they travel somewhere warmer. Some **adapt**: they stay and change how they live.

Write each animal under what it does in winter.

humpback whale · deer (grows a thick coat) · monarch butterfly · little brown bat · groundhog · Canada goose · snowshoe hare (turns white) · squirrel (stores nuts) · black bear

Hibernate	Migrate	Adapt
black bear	monarch butterfly	snowshoe hare (turns white)
little brown bat	Canada goose	deer (grows a thick coat)
groundhog	humpback whale	squirrel (stores nuts)

If you were an animal, would you hibernate, migrate or adapt? Why?

Art © Kevin Coulston

ANSWER KEY · SEASONS · GRADES K–2

Answer Key: Season Riddles

Answers for grown-ups. Some questions have more than one good answer.



Word bank

winter | spring | summer | fall

Read each clue. Write the season. Each season is used twice.

1. Leaves change color and fall to the ground. fall
2. Snow falls and ponds freeze. winter
3. Flowers bloom and baby animals are born. spring
4. It is the hottest season, with the longest days. summer
5. Farmers pick pumpkins and apples. fall
6. Bears are asleep in their dens. winter
7. Rain helps new green plants grow. spring
8. Kids go swimming to cool off. summer

Write your own season riddle for a friend to solve.

Art © Kevin Coulston

ANSWER KEY · DAY AND NIGHT · GRADES K–1

Answer Key: Day or Night?

Answers for grown-ups. Some questions have more than one good answer.



Glue each card under day or night.

Day	Night
eat breakfast	go to sleep
see the sun	see the stars
play at recess	owls hunt
the rooster crows	bats fly
go to school	put on pajamas

✂ Cut out the cards on the dashed lines.

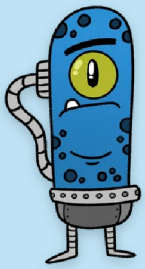
go to sleep	go to school	see the stars	the rooster crows	put on pajamas
eat breakfast	play at recess	bats fly	see the sun	owls hunt

Art © Kevin Coulston

ANSWER KEY · DAY AND NIGHT · GRADES 2–4

Answer Key: Earth Spins: Day and Night

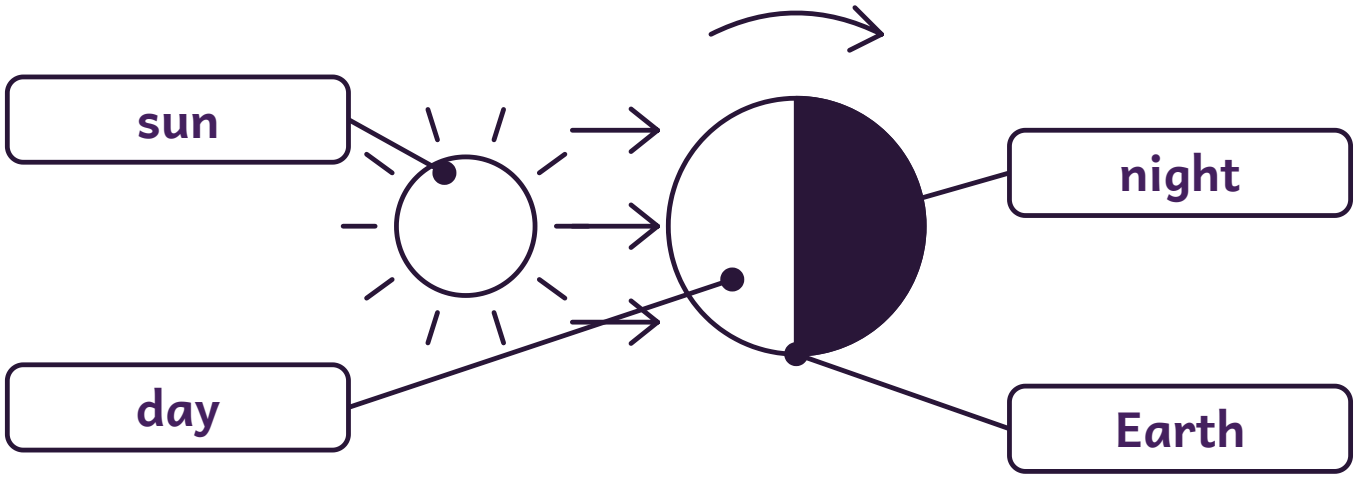
Answers for grown-ups. Some questions have more than one good answer.



Word bank

sun | Earth | day | night | east | west | 24

1. Label the diagram. The arrow shows Earth spinning.



2. Fill in the blanks.

1. Earth spins around once every **24** hours.
2. The side of Earth facing the sun has **day**.
3. The side facing away from the sun has **night**.
4. The sun seems to rise in the **east**.
5. The sun seems to set in the **west**.

Art © Kevin Coulston

ANSWER KEY · DAY AND NIGHT · GRADES 1–3

Answer Key: Nocturnal or Diurnal?



Answers for grown-ups. Some questions have more than one good answer.

Nocturnal animals sleep in the day and are awake at night. **Diurnal** animals are awake in the day and sleep at night, like most people.

Write each animal in the right column.

squirrel · butterfly · honeybee · bat · raccoon · firefly · moth · eagle · chicken · owl

Nocturnal (awake at night)	Diurnal (awake in the day)
owl	butterfly
bat	squirrel
raccoon	eagle
firefly	honeybee
moth	chicken

Big eyes help many nocturnal animals. Why do you think that is?

Art © Kevin Coulston

ANSWER KEY · STARS AND CONSTELLATIONS · GRADES 2–5

Answer Key: Stars: True or False?

Answers for grown-ups. Some questions have more than one good answer.



Circle True or False.

Stars are giant balls of hot, glowing gas.	**True**	False
The sun is the closest star to Earth.	**True**	False
Stars are only in the sky at night.	True	**False**
Stars twinkle because moving air bends their light.	**True**	False
Some stars are much bigger than our sun.	**True**	False
Shooting stars are stars falling to Earth.	True	**False**
People have counted every star in the sky.	True	**False**
Stars last forever and never change.	True	**False**

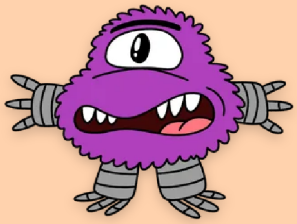
Pick two false sentences and fix them so they are true.

Art © Kevin Coulston

ANSWER KEY · STARS AND CONSTELLATIONS · GRADES 3–5

Answer Key: Space Words

Answers for grown-ups. Some questions have more than one good answer.



1. Draw a line from each word to its meaning.

constellation	a group of stars that makes a picture
galaxy	a huge group of billions of stars
Milky Way	the galaxy our solar system is in
telescope	a tool that makes faraway things look closer
astronomer	a scientist who studies stars and space
light-year	how far light travels in one year

2. Circle the answer.

Stars look tiny to us because they are

very small · **very far away** · very cold

To look at a faraway star, an astronomer uses a

microscope · **telescope** · thermometer

Art © Kevin Coulston

ANSWER KEY · STARS AND CONSTELLATIONS · GRADES 3–5

Answer Key: Star Colors

Answers for grown-ups. Some questions have more than one good answer.



Stars come in different colors. The hottest stars glow **blue-white**. Cooler stars glow **yellow**, then **orange**, and the coolest glow **red**. Our sun is a medium-size yellow star. It looks bigger and brighter than other stars only because it is much closer to us.

1. Number the star colors from hottest (1) to coolest (4).

3 orange

1 blue-white

4 red

2 yellow

Word bank

yellow · blue-white · closer · gas

2. Fill in the blanks.

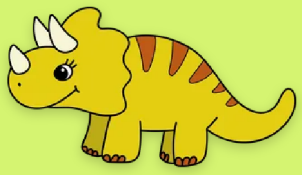
1. Stars are made of hot, glowing **gas**.
2. Our sun is a **yellow** star.
3. The hottest stars are **blue-white**.
4. The sun looks bigger than other stars because it is **closer**.

Art © Kevin Coulston

ANSWER KEY · DINOSAURS · GRADES 1–3

Answer Key: Plant Eater or Meat Eater?

Answers for grown-ups. Some questions have more than one good answer.



Teeth clue: plant eaters had flat or peg-like teeth for munching leaves. Meat eaters had sharp, pointed teeth.

Write each dinosaur in the right column.

Velociraptor · Tyrannosaurus rex · Allosaurus · Stegosaurus · Brachiosaurus · Ankylosaurus · Parasaurolophus · Spinosaurus · Giganotosaurus · Triceratops

Plant eater (herbivore)	Meat eater (carnivore)
Triceratops	Tyrannosaurus rex
Stegosaurus	Velociraptor
Brachiosaurus	Spinosaurus
Ankylosaurus	Allosaurus
Parasaurolophus	Giganotosaurus

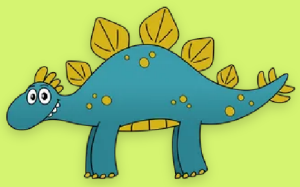
Why do you think plant eaters needed flat teeth?

Art © Kevin Coulston

ANSWER KEY · DINOSAURS · GRADES 2–4

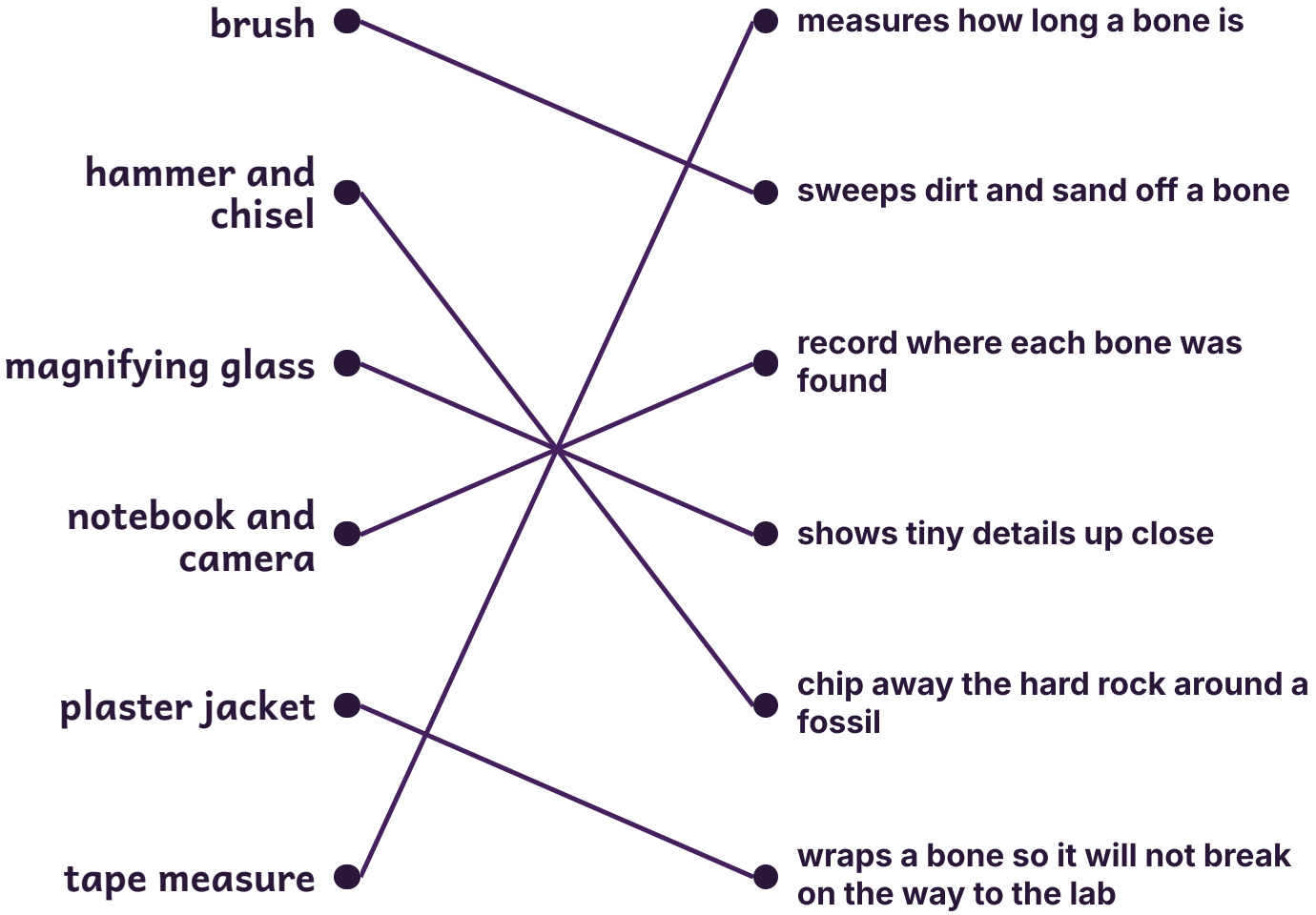
Answer Key: A Paleontologist's Tools

Answers for grown-ups. Some questions have more than one good answer.



A **paleontologist** is a scientist who digs up and studies fossils, like dinosaur bones.

Draw a line from each tool to its job.



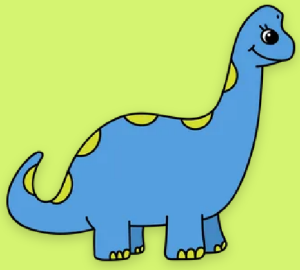
Would you like to be a paleontologist? Why or why not?

Art © Kevin Coulston

ANSWER KEY · DINOSAURS · GRADES 2–4

Answer Key: How Long Were Dinosaurs?

Answers for grown-ups. Some questions have more than one good answer.



About how long each dinosaur was, from nose to tail:
Brachiosaurus: about 85 feet · **Tyrannosaurus rex:** about 40 feet · **Triceratops:** about 30 feet · **Velociraptor:** about 6 feet

Use the lengths to answer.

1. Which dinosaur was the longest? Brachiosaurus

2. Which dinosaur was the shortest? Velociraptor

3. How much longer was T. rex than Triceratops? 10 feet

4. How much longer was Brachiosaurus than T. rex? 45 feet

5. How many Velociraptors in a row would be as long as a Triceratops? 5

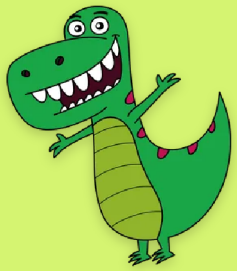
6. Measure your classroom. How long is it? _____

Art © Kevin Coulston

ANSWER KEY · DINOSAURS · GRADES 1–4

Answer Key: Dinosaurs: True or False?

Answers for grown-ups. Some questions have more than one good answer.



Circle True or False.

Dinosaurs lived millions of years ago.	**True**	False
People and dinosaurs lived at the same time.	True	**False**
Birds are related to dinosaurs.	**True**	False
Every dinosaur was huge.	True	**False**
Some dinosaurs had feathers.	**True**	False
Pterodactyls were dinosaurs that could fly.	True	**False**
We learn about dinosaurs from fossils.	**True**	False
Dinosaurs hatched from eggs.	**True**	False

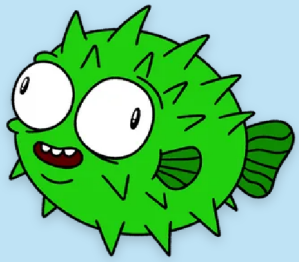
Pick two false sentences and fix them so they are true.

Art © Kevin Coulston

ANSWER KEY · OCEANS · GRADES 3–5

Answer Key: The Ocean Zones

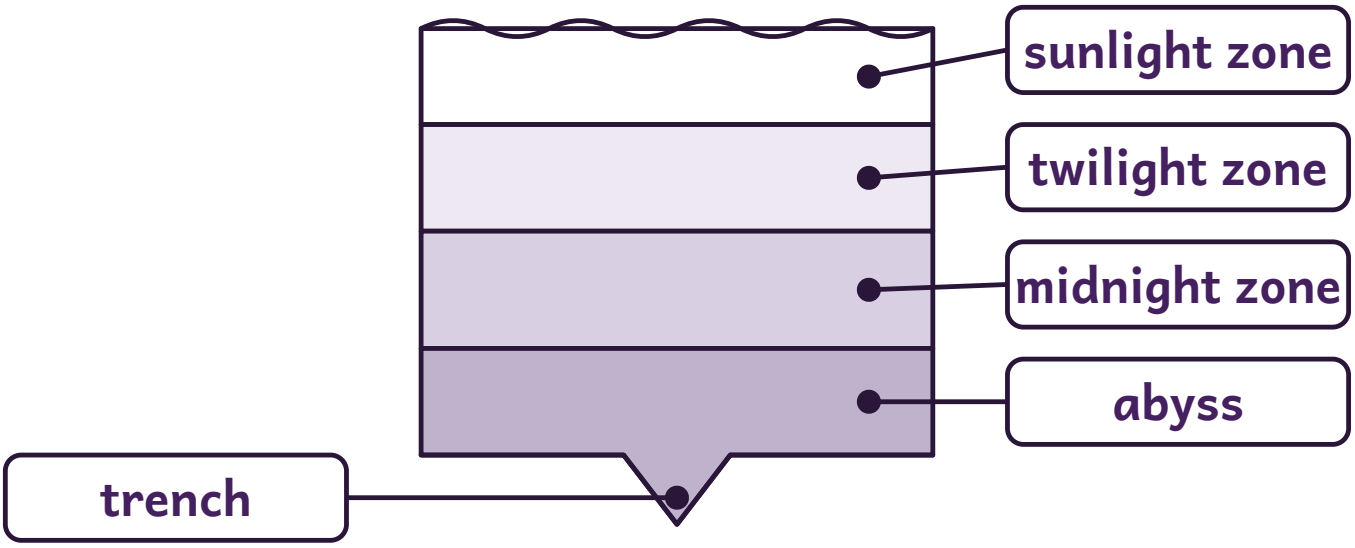
Answers for grown-ups. Some questions have more than one good answer.



Word bank

sunlight zone | twilight zone | midnight zone | abyss | trench

1. Label the ocean zones from the top down.



2. Circle the answer.

Which zone gets enough sunlight for seaweed to grow?

sunlight zone | midnight zone | abyss

An anglerfish makes its own light. Where does it live?

sunlight zone | **midnight zone** | a tide pool

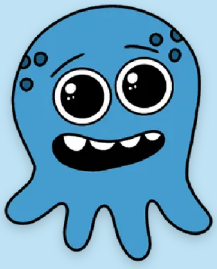
The deepest places in the ocean are **trenches** | coral reefs | beaches

Art © Kevin Coulston

ANSWER KEY · OCEANS · GRADES 2–4

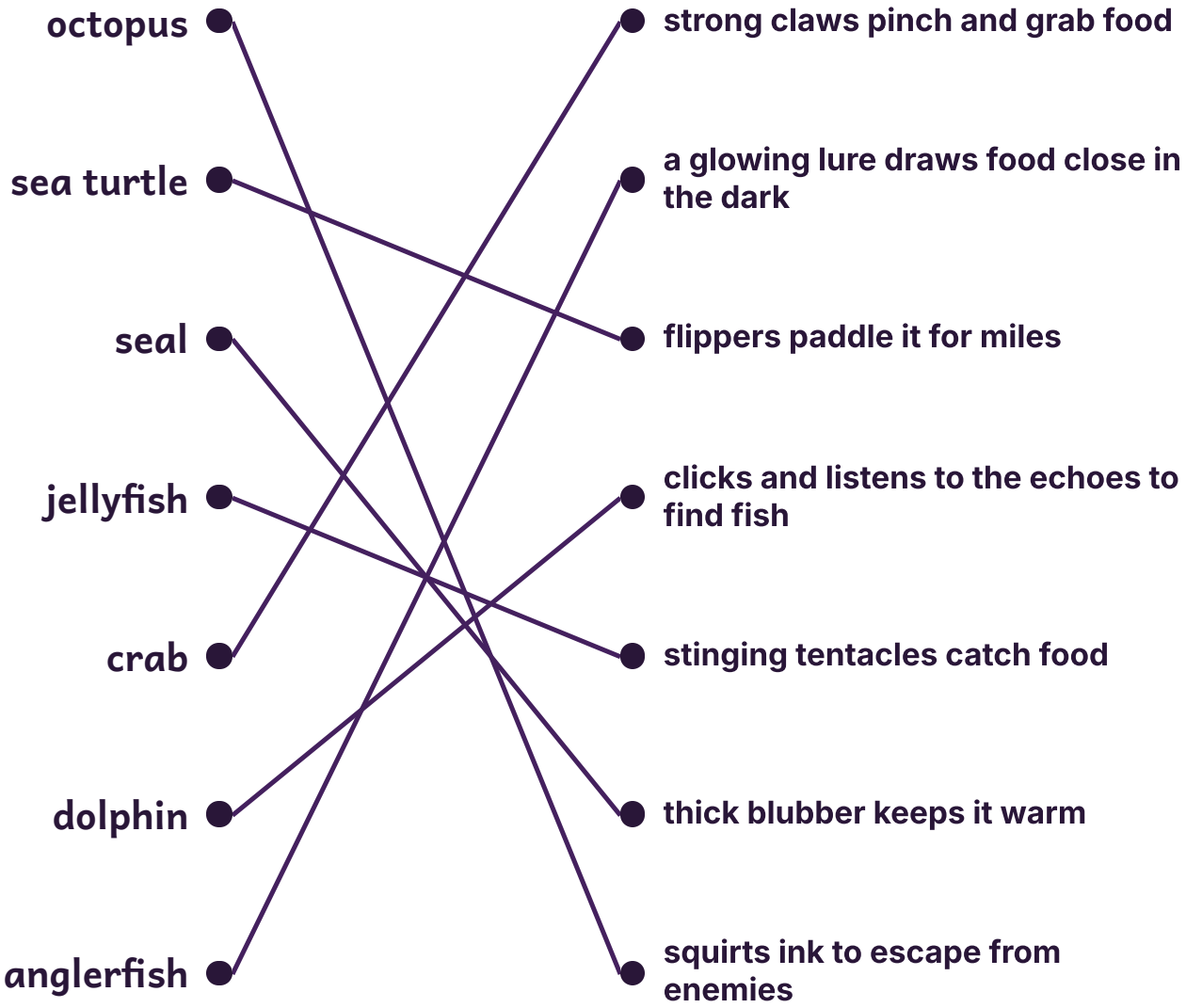
Answer Key: Sea Animal Adaptations

Answers for grown-ups. Some questions have more than one good answer.



An **adaptation** is a body part or a behavior that helps an animal live in its habitat.

Draw a line from each sea animal to its adaptation.



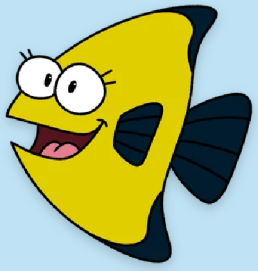
Which adaptation would you like to have? Why?

Art © Kevin Coulston

ANSWER KEY · OCEANS · GRADES 2–5

Answer Key: Coral Reefs

Answers for grown-ups. Some questions have more than one good answer.



Coral reefs are called the **rainforests of the sea** because so many kinds of living things live there.

Circle True or False.

Coral is an animal.	**True**	False
Coral reefs grow in warm, shallow, clear water.	**True**	False
The Great Barrier Reef is near Australia.	**True**	False
Coral reefs grow many feet every year.	True	**False**
Fish use reefs to hide and to find food.	**True**	False
Water that gets too warm can make coral sick and turn it white.	**True**	False
Coral reefs cover most of the ocean floor.	True	**False**

Draw a coral reef with three animals that live there. Label them.

Art © Kevin Coulston

ANSWER KEY · OCEANS · GRADES 1–4

Answer Key: Help the Ocean

Answers for grown-ups. Some questions have more than one good answer.



Color the choices that help the ocean. Put an X on the ones that hurt it.

pick up trash at the beach	let balloons float away	use a water bottle you can refill
leave trash on the sand	recycle cans and bottles	throw old fishing line in the water
bring a cloth bag to the store	pour paint down a storm drain	leave shells and sea animals where you find them
stand on coral when you snorkel	say no to a plastic straw	drop plastic bags outside

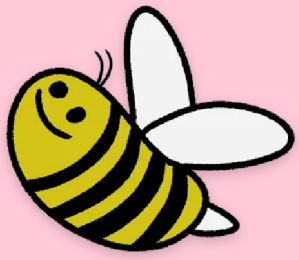
One way my class can help the ocean:

Art © Kevin Coulston

ANSWER KEY · INSECTS AND SPIDERS · GRADES 1–3

Answer Key: Is It an Insect?

Answers for grown-ups. Some questions have more than one good answer.



An insect has 6 legs, 3 body parts and 2 antennae. A spider is not an insect.



insect: 6 legs, 3 body parts



spider: 8 legs, 2 body parts

Circle Insect or Not an insect.

ant	**Insect**	Not an insect
spider	Insect	**Not an insect**
ladybug	**Insect**	Not an insect
earthworm	Insect	**Not an insect**
honeybee	**Insect**	Not an insect
butterfly	**Insect**	Not an insect
snail	Insect	**Not an insect**
grasshopper	**Insect**	Not an insect
centipede	Insect	**Not an insect**
beetle	**Insect**	Not an insect

Art © Kevin Coulston

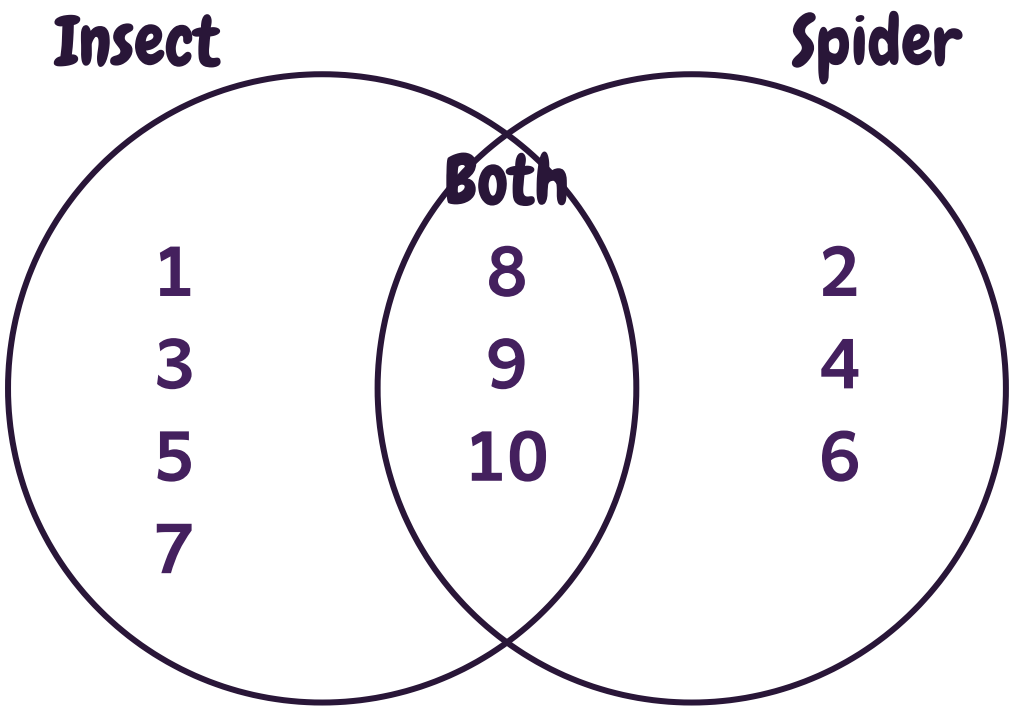
ANSWER KEY · INSECTS AND SPIDERS · GRADES 2–3

Answer Key: Insect or Spider?

Answers for grown-ups. Some questions have more than one good answer.



Write the number of each fact in the right part of the diagram.



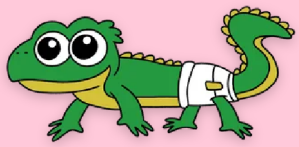
1. has 6 legs
2. has 8 legs
3. has 3 body parts
4. has 2 body parts
5. has antennae
6. spins webs to catch food
7. many kinds have wings
8. has a hard outside skeleton
9. hatches from an egg
10. has no backbone

Art © Kevin Coulston

ANSWER KEY · INSECTS AND SPIDERS · GRADES K–2

Answer Key: The Life Cycle of a Ladybug

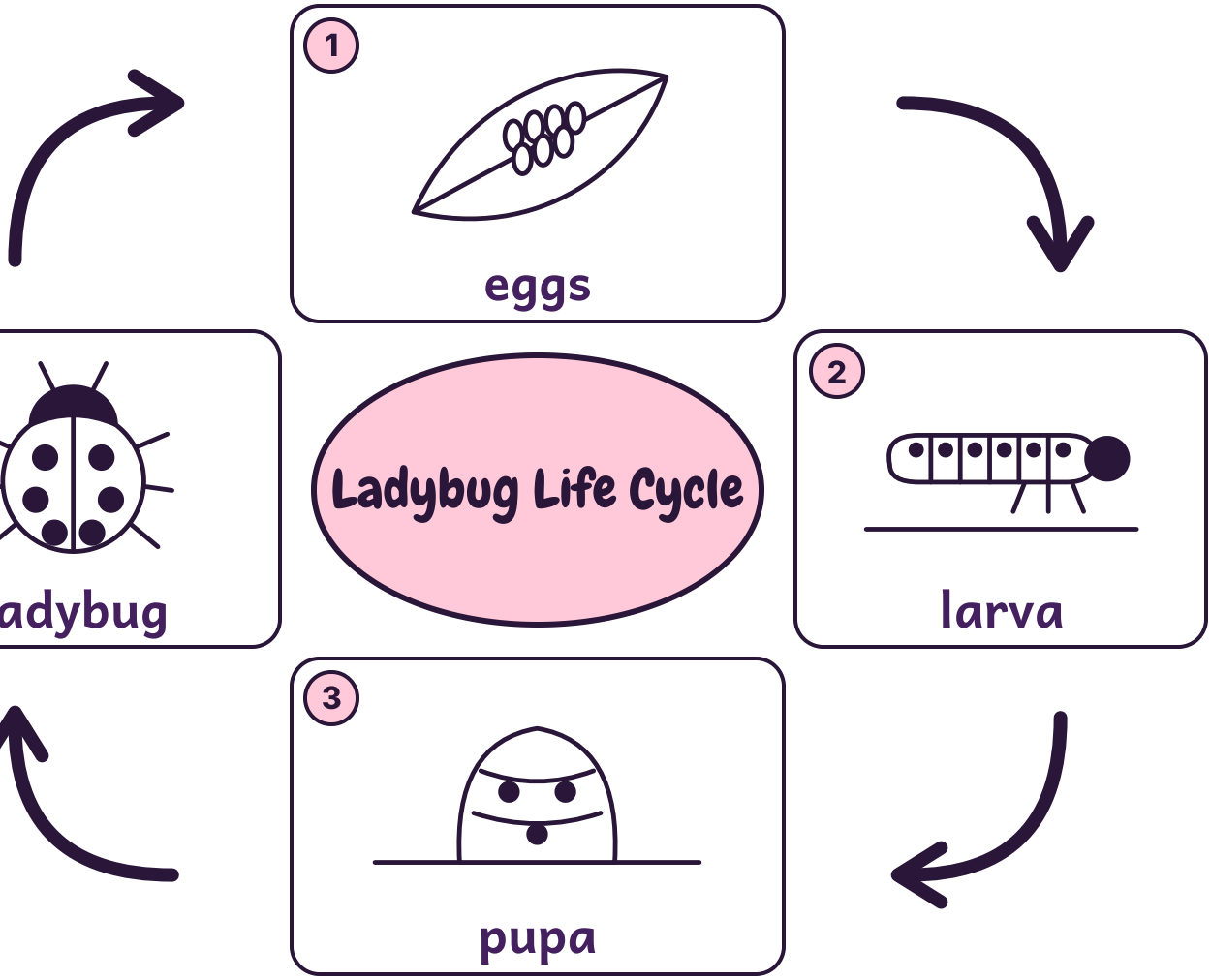
Answers for grown-ups. Some questions have more than one good answer.



Word bank

eggs · larva · pupa · ladybug

Write the name of each stage.



Circle the answer.

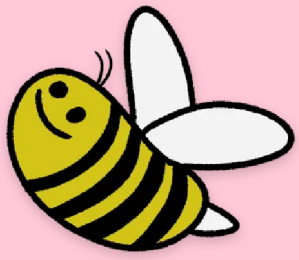
A ladybug larva eats tiny bugs called **aphids** / fish / seeds

Art © Kevin Coulston

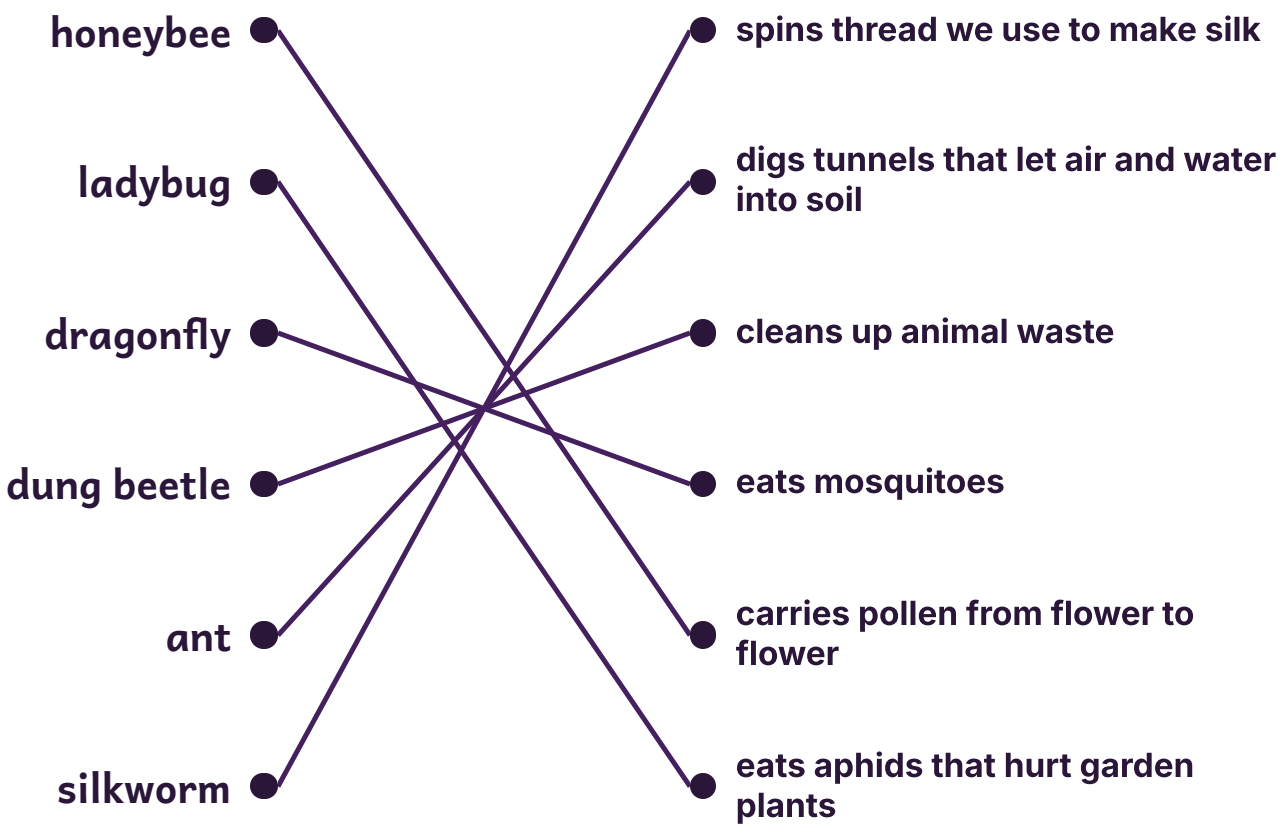
ANSWER KEY · INSECTS AND SPIDERS · GRADES 1–3

Answer Key: Bugs at Work

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each bug to the job it does.



Draw your favorite helpful bug doing its job.

Art © Kevin Coulston

ANSWER KEY · BIRDS · GRADES 2–4

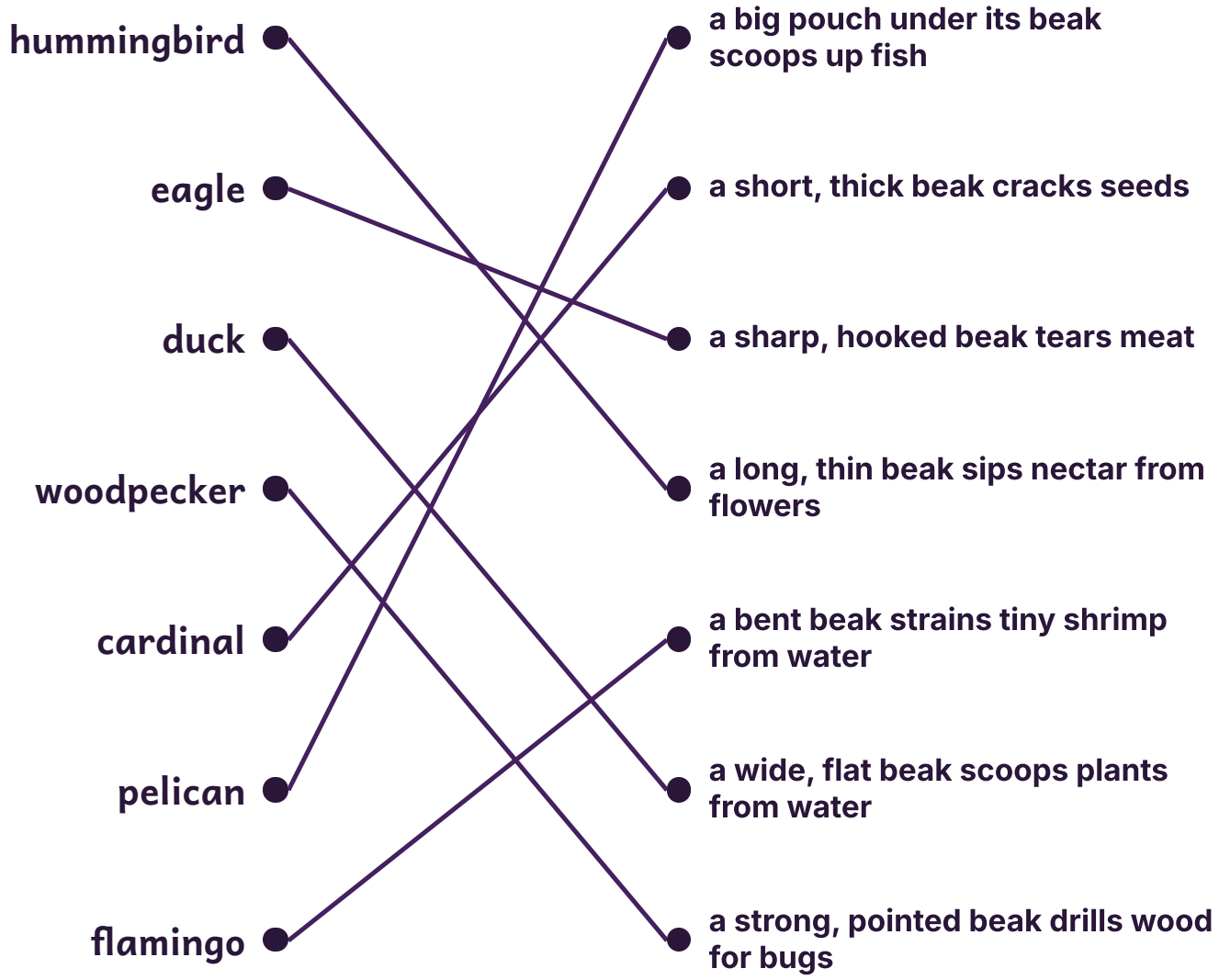
Answer Key: Beaks and What Birds Eat

Answers for grown-ups. Some questions have more than one good answer.



A bird's beak is a tool. Its shape tells you what the bird eats.

Draw a line from each bird to the beak and food that fit it.



Which beak would you want for your favorite food?

Art © Kevin Coulston

ANSWER KEY · BIRDS · GRADES 1–3

Answer Key: Parts of a Bird

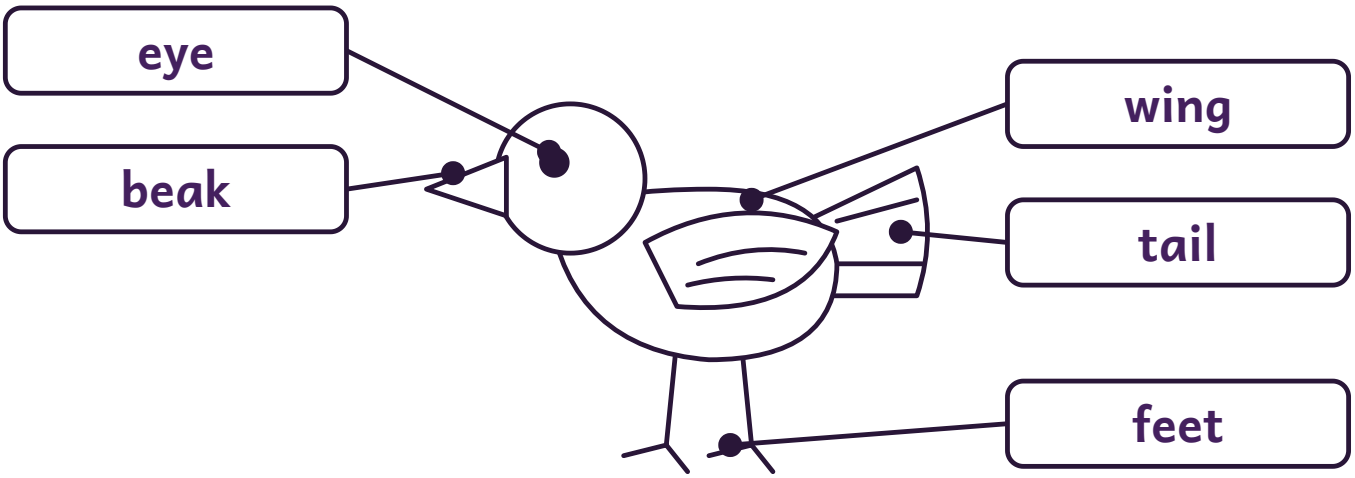
Answers for grown-ups. Some questions have more than one good answer.



Word bank

beak · eye · wing · tail · feet

Write the name of each part.



Fill in the blanks.

1. A bird flaps each **wing** to fly.

2. A bird uses its **beak** to pick up food.

Art © Kevin Coulston

ANSWER KEY · BIRDS · GRADES K–2

Answer Key: What Makes a Bird?

Answers for grown-ups. Some questions have more than one good answer.



Color the 6 things every bird has. Put an X on the 6 things birds do not have.

feathers	~~fur~~	a beak
~~ears~~	wings	~~six wings~~
two legs	~~teeth~~	lays eggs
~~teeth~~	a backbone	~~hooves~~

Name a bird that cannot fly.

_____

Art © Kevin Coulston

ANSWER KEY · BIRDS · GRADES 2–4

Answer Key: Why Do Birds Migrate?

Answers for grown-ups. Some questions have more than one good answer.



To **migrate** means to travel a long way each year when the seasons change.

Word bank

south · food · Arctic tern · flock · north

1. Fill in the blanks.

1. Many birds fly **south** in the fall.
2. They migrate to find more **food** in winter.
3. Birds often fly together in a group called a **flock**.
4. In spring, they fly back **north** to build nests.
5. The **Arctic tern** flies from the Arctic to Antarctica and back every year.

2. Circle True or False.

All birds migrate.	True	**False**
Birds can use the sun and stars to find their way.	**True**	False
Some hummingbirds migrate too.	**True**	False
Penguins fly south for the winter.	True	**False**

Art © Kevin Coulston

ANSWER KEY · TREES AND LEAVES · GRADES 1–3

Answer Key: Parts of a Tree

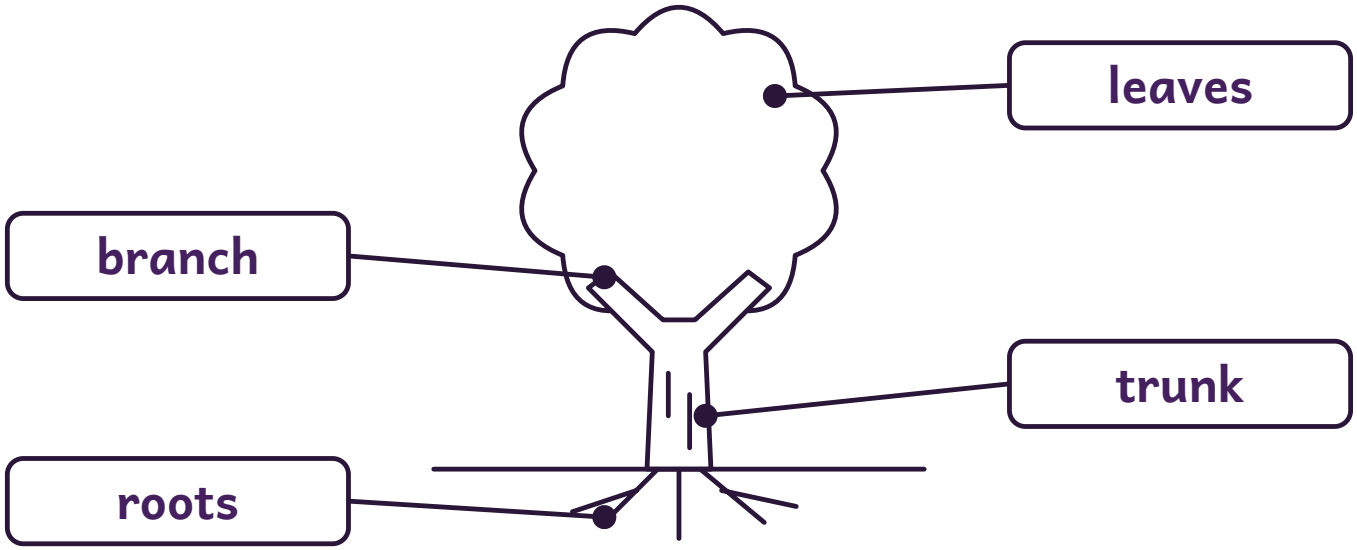
Answers for grown-ups. Some questions have more than one good answer.



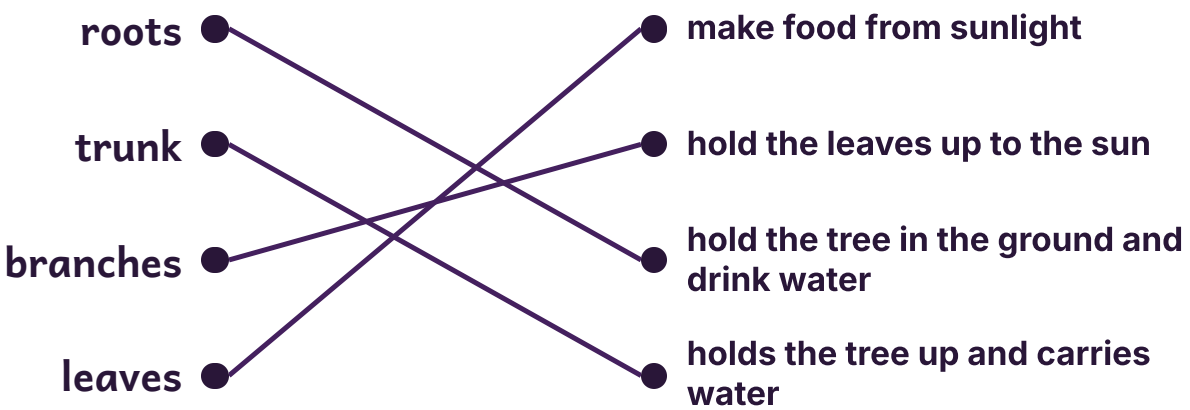
Word bank

leaves | branch | trunk | roots

1. Write the name of each part.



2. Draw a line from each part to its job.

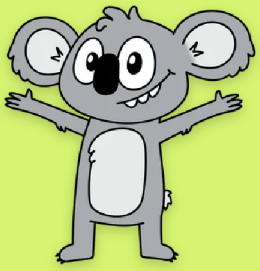


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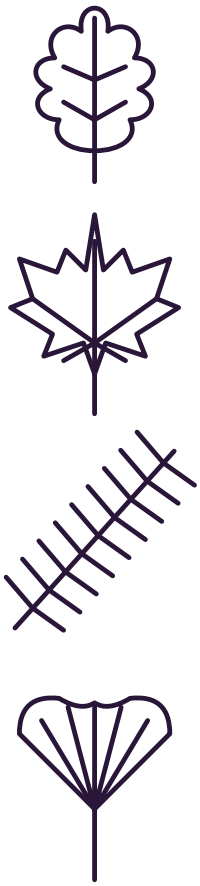
ANSWER KEY · TREES AND LEAVES · GRADES 1–3

Answer Key: Leaf Shapes

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each leaf to its name.



- ginkgo leaf: shaped like a fan
- oak leaf: round bumps called lobes
- maple leaf: pointy lobes, like a hand
- pine needles: long, thin and sharp

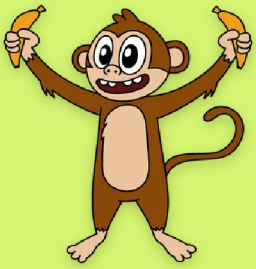
Leaf rubbing: put a leaf under this paper and rub over it with the side of a crayon.

Art © Kevin Coulston

ANSWER KEY · TREES AND LEAVES · GRADES 2–4

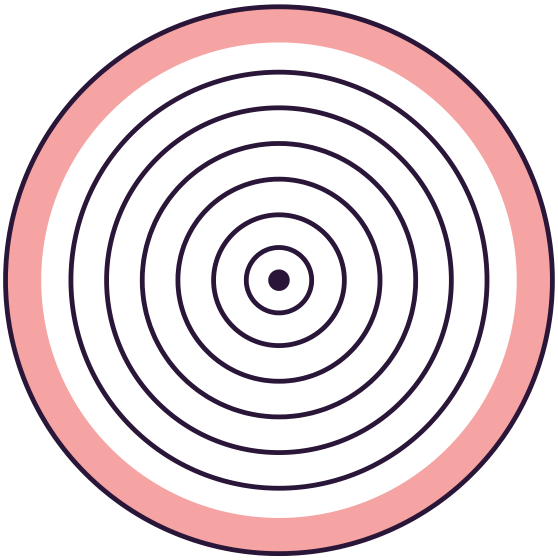
Answer Key: How Old Is the Tree?

Answers for grown-ups. Some questions have more than one good answer.



Every year a tree grows one new **ring** of wood just under its bark. Count the rings on a stump to find out how old the tree was.

A tree stump. The bark is the gray ring around the outside.



1. How many rings? Do not count the bark. 6

2. How old was the tree? 6 years

3. It was cut down in 2026. When did it start to grow? 2020

Circle the answer.

A wide ring means the tree had

a good growing year | a bad growing year

A thin ring could mean there was

lots of rain | **not much rain**

Art © Kevin Coulston

ANSWER KEY · TREES AND LEAVES · GRADES K–2

Answer Key: Gifts from Trees

Answers for grown-ups. Some questions have more than one good answer.



Color the 8 things we get from trees. Put an X on the 4 we do not.

paper	apples	a [illegible]s
maple syrup	a wooden chair	a plas[illegible] bottle
shade on a hot day	fresh air to breathe	a met[illegible]spoon
a home for birds	cinnamon	a [illegible]ck

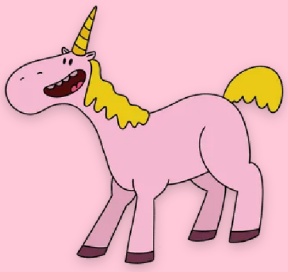
Thank you, tree, for…

Art © Kevin Coulston

ANSWER KEY · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 3–5

Answer Key: Parts of a Flower

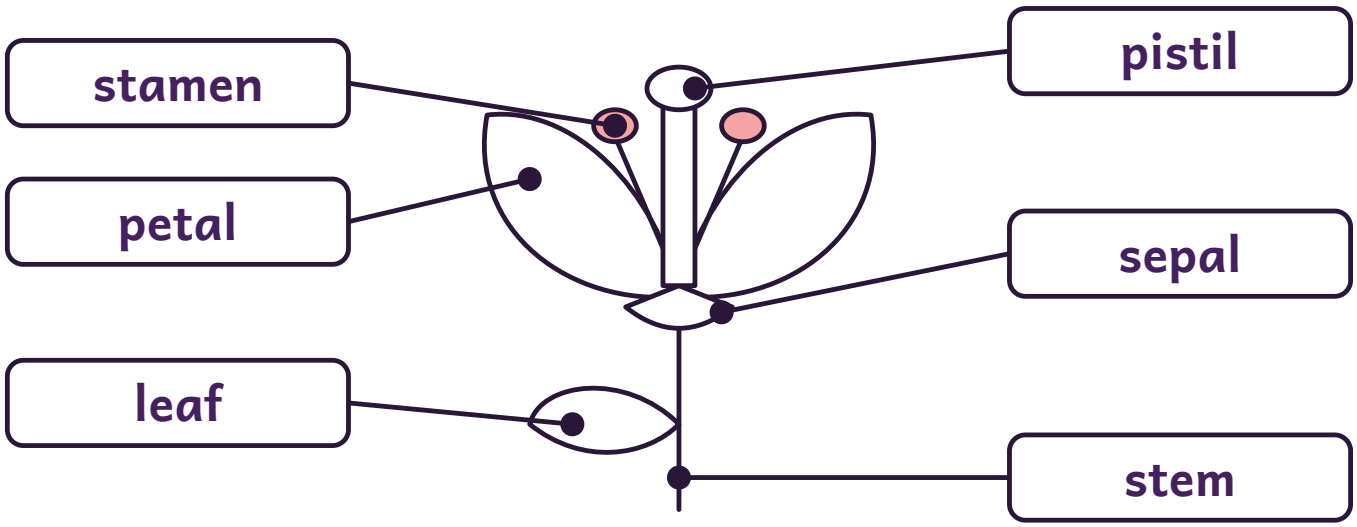
Answers for grown-ups. Some questions have more than one good answer.



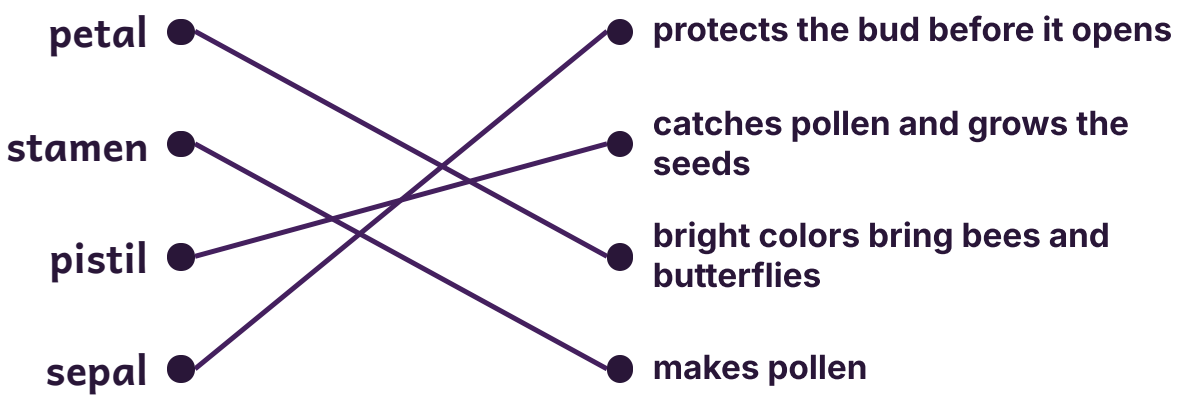
Word bank

petal · stamen · pistil · sepal · stem · leaf

1. Write the name of each part.



2. Draw a line from each part to its job.

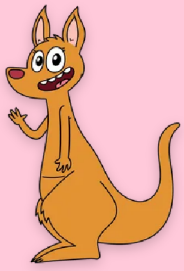


Art © Kevin Coulston

ANSWER KEY · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–4

Answer Key: How Do Seeds Travel?

Answers for grown-ups. Some questions have more than one good answer.



Plants cannot walk, so their seeds travel to new places to grow. Some **blow in the wind**, some **float on water** and some **ride on animals** or get eaten and dropped far away.

Write each seed under the way it travels.

water lily seed · berry eaten by a bird · coconut · maple "helicopter" · milkweed silk · mangrove pod · burr that sticks to fur · acorn buried by a squirrel · dandelion fluff

Wind	Water	Animals
dandelion fluff	coconut	burr that sticks to fur
maple "helicopter"	mangrove pod	berry eaten by a bird
milkweed silk	water lily seed	acorn buried by a squirrel

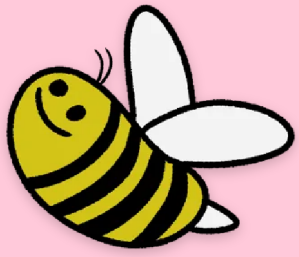
Invent a seed. How would it travel?

Art © Kevin Coulston

ANSWER KEY · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–4

Answer Key: How a Bee Pollinates a Flower

Answers for grown-ups. Some questions have more than one good answer.



Pollination is how pollen gets from one flower to another so the flowers can make seeds.

Number the steps from 1 to 5.

2 Pollen sticks to the bee's fuzzy body.

5 The flower can now make seeds.

1 A bee lands on a flower to drink nectar.

4 Some pollen rubs off onto the new flower's pistil.

3 The bee flies to another flower of the same kind.

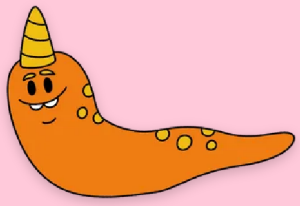
Draw a bee visiting a flower. Show the pollen on the bee.

Art © Kevin Coulston

ANSWER KEY · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 3–5

Answer Key: How Plants Make Food

Answers for grown-ups. Some questions have more than one good answer.



Photosynthesis is how a plant makes its own food in its leaves, using light, water and air.

Word bank

carbon dioxide · water · sunlight · chlorophyll · sugar · oxygen

1. Fill in the blanks.

1. Leaves take in **carbon dioxide** from the air through tiny holes.
2. Roots take in **water** from the soil.
3. Leaves use energy from **sunlight** to make food.
4. The green color in leaves, **chlorophyll**, catches the light.
5. The food a plant makes is a kind of **sugar**.
6. Plants give off **oxygen**, the gas we breathe.

2. Circle the answer.

A plant kept in a dark closet for weeks would

grow better · **not be able to make food**

Art © Kevin Coulston

ANSWER KEY · FLOWERS, SEEDS AND PHOTOSYNTHESIS · GRADES 2–5

Answer Key: Open a Bean Seed

Answers for grown-ups. Some questions have more than one good answer.

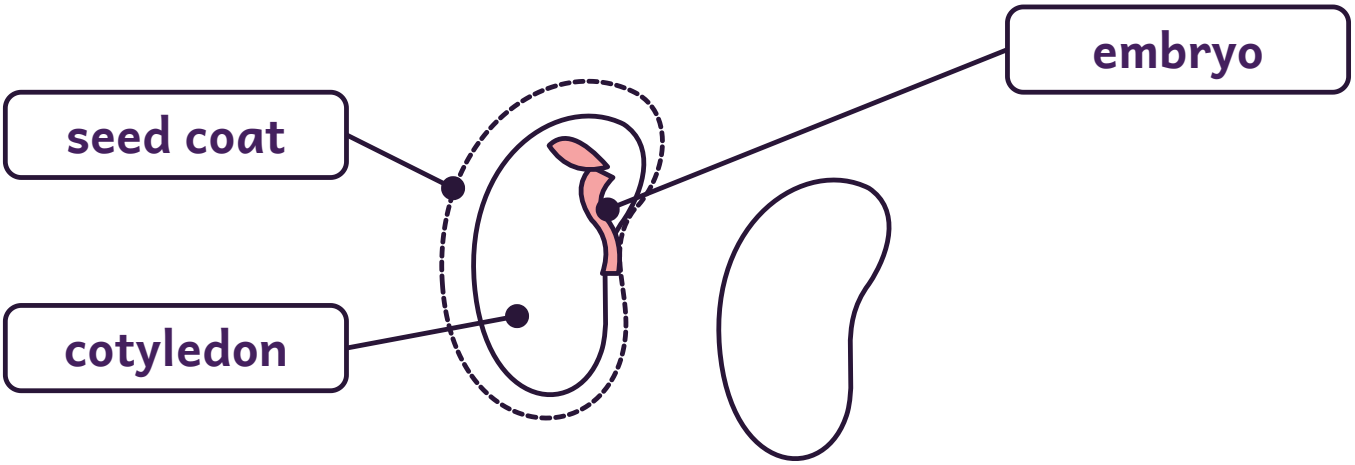


Do it: soak a dry lima bean in water overnight. Gently peel off the thin skin, then split the bean in half with your fingernail. Look closely with a magnifying glass.

Word bank

seed coat · cotyledon · embryo

1. Label the parts of the seed.



2. Draw your seed up close.

3. The embryo is a tiny baby plant. What do you think the cotyledon does for it?

Art © Kevin Coulston

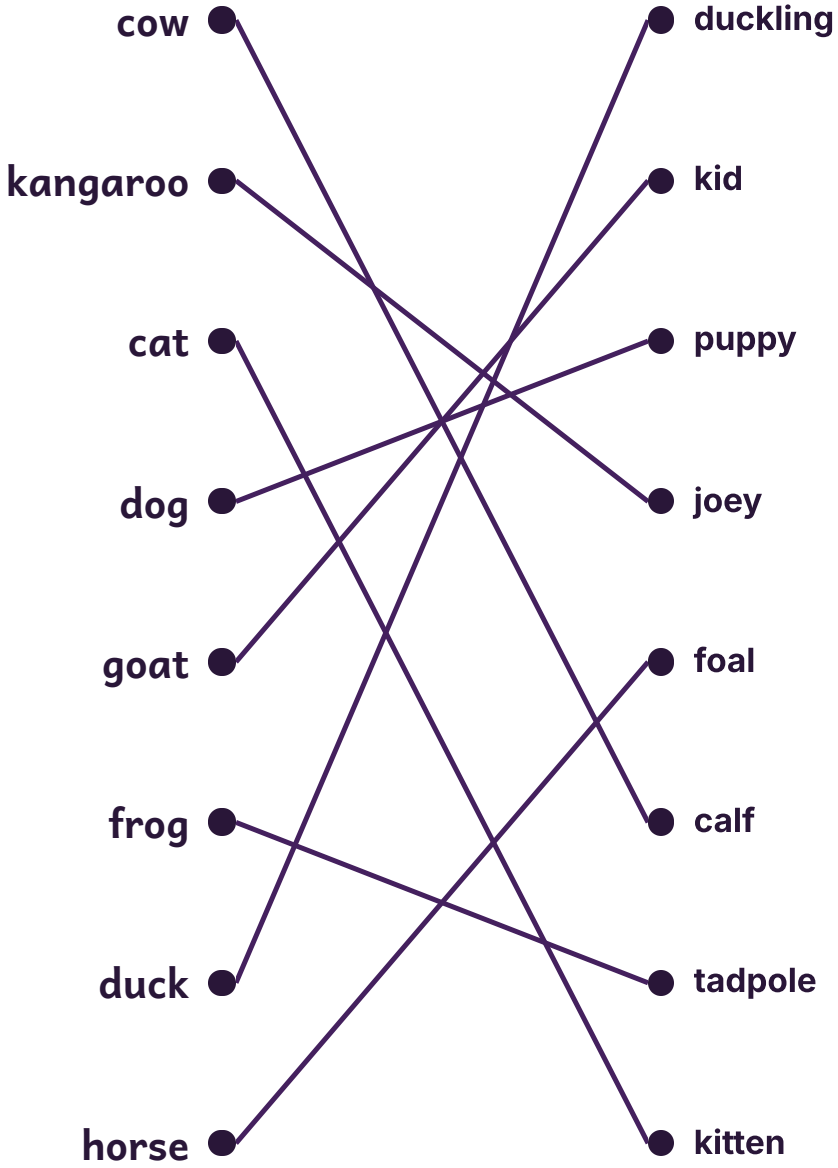
ANSWER KEY · ANIMAL BABIES AND TRAITS · GRADES K–2

Answer Key: Baby Animal Names

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each animal to its baby.



What is a baby person called?

Art © Kevin Coulston

ANSWER KEY · ANIMAL BABIES AND TRAITS · GRADES K–2

Answer Key: Does the Baby Look Like Its Parent?

Answers for grown-ups. Some questions have more than one good answer.



Does the baby look like its parent? Circle Yes or No.

a kitten and a cat	**Yes** / No
a caterpillar and a butterfly	Yes / **No**
a calf and a cow	**Yes** / No
a tadpole and a frog	Yes / **No**
a puppy and a dog	**Yes** / No
a foal and a horse	**Yes** / No
a grub and a beetle	Yes / **No**
a baby elephant and its mother	**Yes** / No

Draw a baby animal and its parent. How are they alike?

Art © Kevin Coulston

ANSWER KEY · ANIMAL BABIES AND TRAITS · GRADES 3–5

Answer Key: Inherited or Learned?

Answers for grown-ups. Some questions have more than one good answer.



An **inherited** trait is passed from parents to their young, like eye color. A **learned** skill is something you practice, like riding a bike.

Write each one in the right column.

speaking Spanish · riding a bike · reading a book · curly hair · freckles · a zebra's stripes · a duck's webbed feet · a dog sitting when told · playing the piano · eye color

Inherited	Learned
eye color	riding a bike
curly hair	speaking Spanish
freckles	a dog sitting when told
a zebra's stripes	reading a book
a duck's webbed feet	playing the piano

Name one trait you inherited and one thing you learned.

Art © Kevin Coulston

ANSWER KEY · ANIMAL BABIES AND TRAITS · GRADES 1–3

Answer Key: Who Takes Care of the Babies?

Answers for grown-ups. Some questions have more than one good answer.



Write each animal in the right column.

salmon · sea turtle · garter snake · elephant · penguin · robin · wolf · ladybug · monarch butterfly · kangaroo

Parents take care of the babies	The babies are on their own
kangaroo	sea turtle
elephant	salmon
penguin	ladybug
robin	garter snake
wolf	monarch butterfly

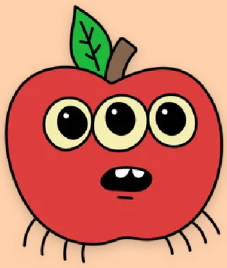
How do grown-ups take care of you?

Art © Kevin Coulston

ANSWER KEY · FOOD GROUPS AND HEALTHY EATING · GRADES 1–3

Answer Key: The Five Food Groups

Answers for grown-ups. Some questions have more than one good answer.



Write each food under its food group.

bread · eggs · strawberries · cheese · rice · fish · carrot · banana · chicken · broccoli · peas · pasta · milk · yogurt · apple

Fruits	Vegetables	Grains	Protein	Dairy
apple	carrot	bread	chicken	milk
banana	broccoli	rice	eggs	cheese
strawberries	peas	pasta	fish	yogurt

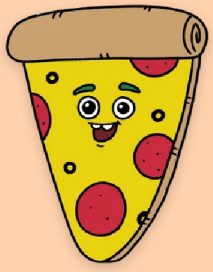
Which food group do you eat the most?

Art © Kevin Coulston

ANSWER KEY · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

Answer Key: My Healthy Plate

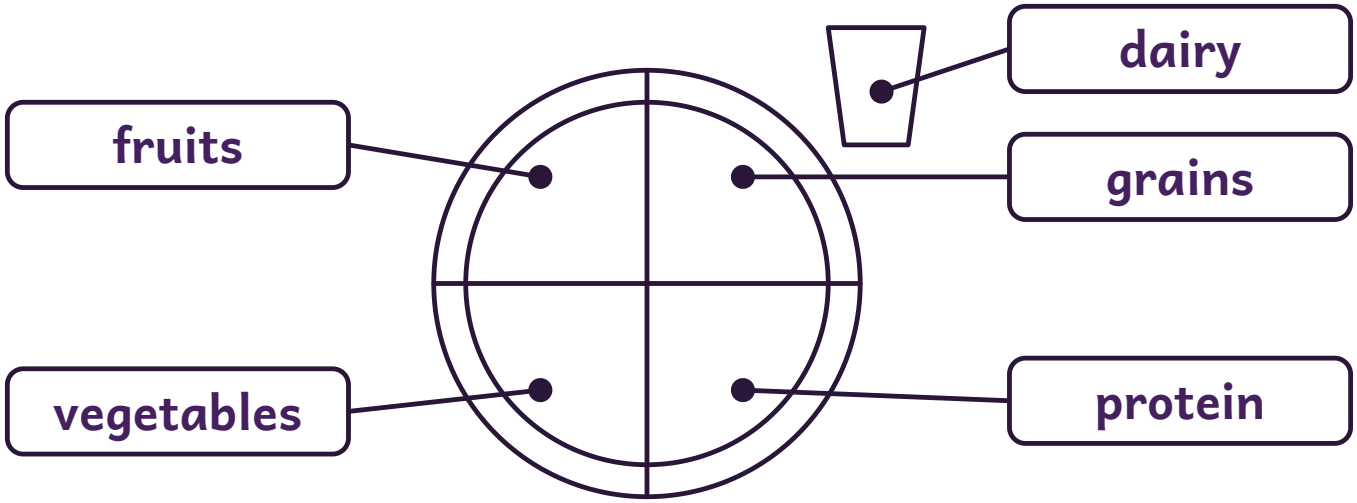
Answers for grown-ups. Some questions have more than one good answer.



Word bank

fruits | vegetables | grains | protein | dairy

Label each part of the plate and the cup.



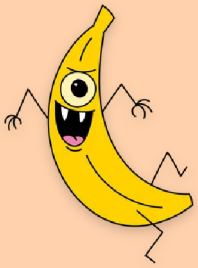
Draw a healthy lunch with a food from every group.

Art © Kevin Coulston

ANSWER KEY · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

Answer Key: Everyday or Sometimes Foods?

Answers for grown-ups. Some questions have more than one good answer.



Color the everyday foods. Put an X on the sometimes foods.

apple	candy	carrots	soda
milk	chips	water	cupcake
yogurt	cookies	oatmeal	eggs

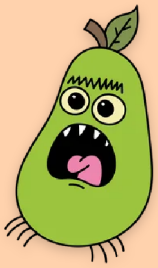
My favorite everyday food _____ **My favorite sometimes food** _____

Art © Kevin Coulston

ANSWER KEY · FOOD GROUPS AND HEALTHY EATING · GRADES 4–5

Answer Key: Read a Food Label

Answers for grown-ups. Some questions have more than one good answer.



Nutrition Facts

10 servings per box

Serving size	1 cup
Calories	**120**
Total fat	1.5 g
Sodium	160 mg
Total carbohydrate	25 g
Dietary fiber	3 g
Total sugars	6 g
Protein	3 g

Circle the answer.

In one serving, there is more

sugar protein

Foods with 5 g of fiber or more are high in fiber. Is this cereal high in fiber?

yes **no**

Read the cereal label. Answer the questions.

1. How big is one serving? 1 cup

2. How many servings are in the box? 10

3. How many calories are in one serving? 120

4. How many grams of sugar are in one serving? 6 g

5. You eat 2 cups. How many calories is that? 240

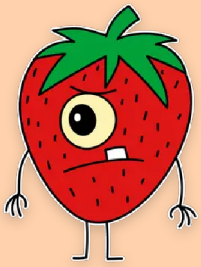
6. How many calories are in the whole box? 1,200

Art © Kevin Coulston

ANSWER KEY · FOOD GROUPS AND HEALTHY EATING · GRADES K–2

Answer Key: Food from Plants or Animals?

Answers for grown-ups. Some questions have more than one good answer.



Glue each food under where it comes from.

From a plant	From an animal
apple	milk
rice	eggs
potato	cheese
bread	honey
popcorn	chicken
peanut butter	fish

✂ Cut out the cards on the dashed lines.

apple	potato	popcorn	peanut butter	eggs	cheese
chicken	bread	fish	milk	rice	honey

Art © Kevin Coulston

ANSWER KEY · LANDFORMS AND EROSION · GRADES 2–4

Answer Key: Landforms

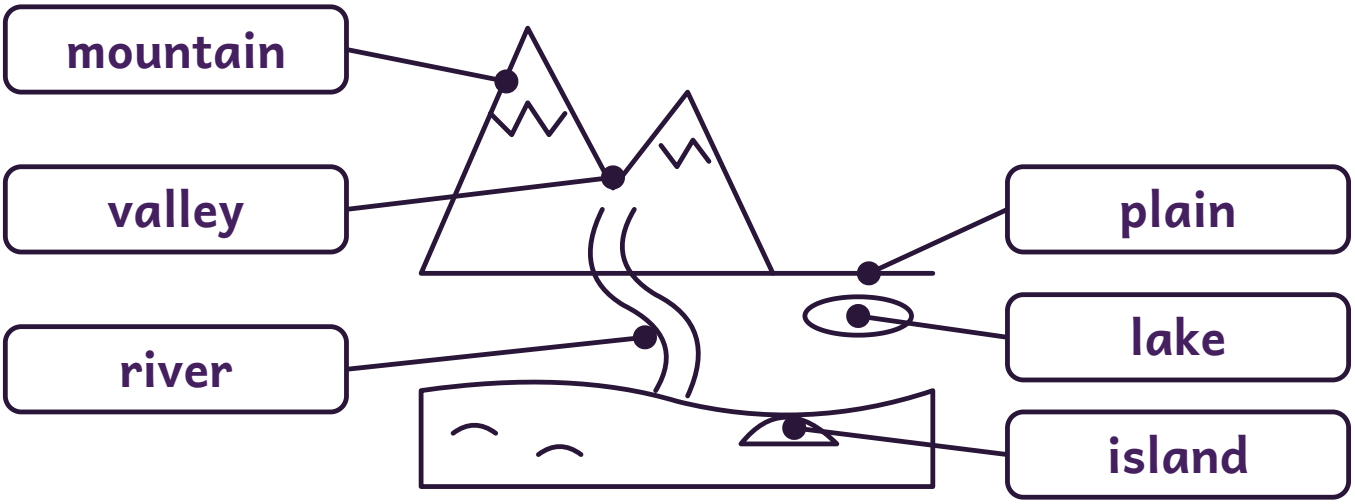
Answers for grown-ups. Some questions have more than one good answer.



Word bank

mountain · valley · river · lake · island · plain

Write the name of each landform.



Draw a landform near where you live. Write its name.

Art © Kevin Coulston

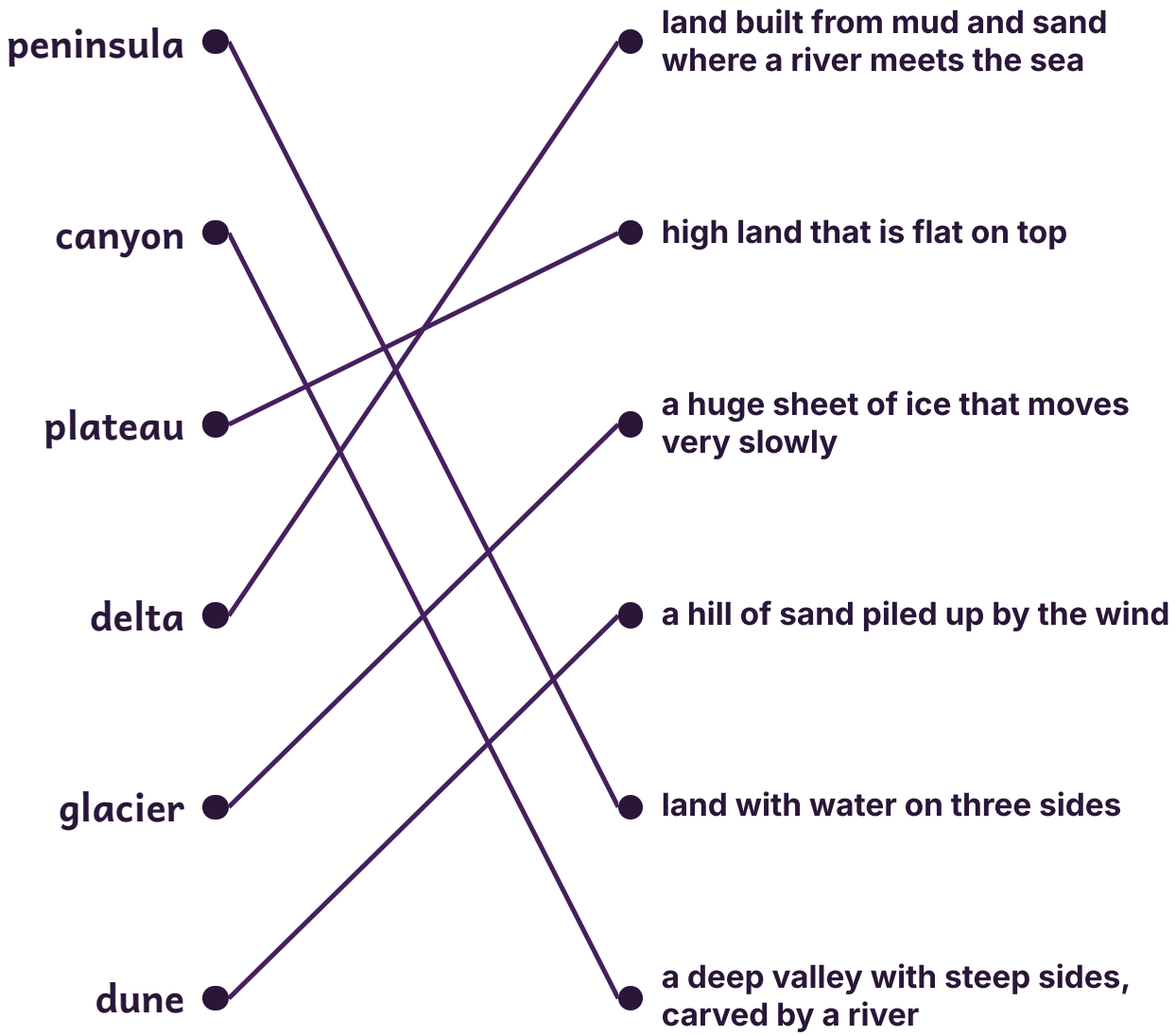
ANSWER KEY · LANDFORMS AND EROSION · GRADES 3–5

Answer Key: More Landform Words

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each word to its meaning.



Which of these landforms would you most like to visit? Why?

Art © Kevin Coulston

ANSWER KEY · LANDFORMS AND EROSION · GRADES 3–5

Answer Key: Weathering or Erosion?



Answers for grown-ups. Some questions have more than one good answer.

Weathering breaks rock into smaller pieces. **Erosion** carries the pieces away to a new place. Water, wind, ice and plants can do both.

Write each change in the right column.

- wind piles sand into dunes
- a river carries sand downstream
- waves wash beach sand away
- tree roots crack a sidewalk
- rain slowly wears away a stone statue
- blowing sand scratches a rock
- a rock cracks from hot days and cold nights
- a glacier drags rocks down a valley
- a landslide moves dirt down a hill
- water freezes in a crack and splits a rock

Weathering (breaking)	Erosion (moving)
water freezes in a crack and splits a rock	a river carries sand downstream
tree roots crack a sidewalk	wind piles sand into dunes
rain slowly wears away a stone statue	a glacier drags rocks down a valley
blowing sand scratches a rock	waves wash beach sand away
a rock cracks from hot days and cold nights	a landslide moves dirt down a hill

In your own words, how are weathering and erosion different?

Art © Kevin Coulston

ANSWER KEY · LANDFORMS AND EROSION · GRADES 2–4

Answer Key: Fast or Slow Changes?

Answers for grown-ups. Some questions have more than one good answer.



Write each change to Earth's surface in the right column.

a river carving a canyon · a glacier carving a valley · a landslide · a volcano erupting · a flood · mountains wearing down · waves shaping a rocky cliff · an earthquake

Fast (minutes, hours or days)	Slow (hundreds of years or more)
an earthquake	a river carving a canyon
a landslide	mountains wearing down
a volcano erupting	a glacier carving a valley
a flood	waves shaping a rocky cliff

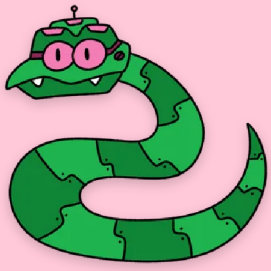
Draw one fast change and one slow change.

Art © Kevin Coulston

ANSWER KEY · VOLCANOES AND EARTHQUAKES · GRADES 2–5

Answer Key: Parts of a Volcano

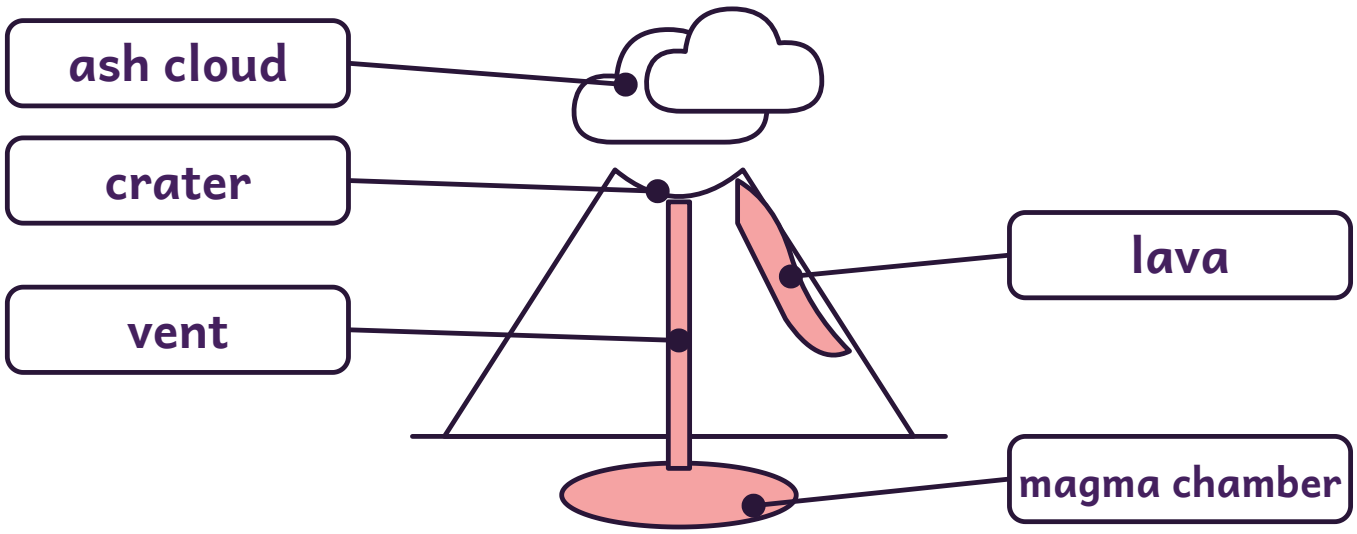
Answers for grown-ups. Some questions have more than one good answer.



Word bank

ash cloud · crater · vent · lava · magma chamber · magma · rock

1. Label the volcano.



2. Fill in the blanks.

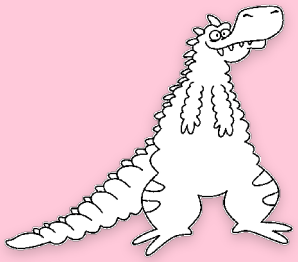
1. Melted rock under the ground is called **magma**.
2. When melted rock comes out of a volcano, it is called **lava**.
3. When lava cools, it hardens into **rock**.

Art © Kevin Coulston

ANSWER KEY · VOLCANOES AND EARTHQUAKES · GRADES 2–5

Answer Key: Volcanoes: True or False?

Answers for grown-ups. Some questions have more than one good answer.



Circle True or False.

Magma is melted rock under the ground.	**True**	False
Lava is magma that reaches the surface.	**True**	False
Every volcano is erupting right now.	True	**False**
Some volcanoes are under the ocean.	**True**	False
The Hawaiian Islands were made by volcanoes.	**True**	False
Volcanic ash is soft and fluffy like smoke.	True	**False**
Mount Everest is a volcano.	True	**False**
Scientists who study volcanoes are called volcanologists.	**True**	False

Pick two false sentences and fix them so they are true.

Art © Kevin Coulston

ANSWER KEY · VOLCANOES AND EARTHQUAKES · GRADES 1–4

Answer Key: Earthquake Safety

Answers for grown-ups. Some questions have more than one good answer.



When the ground shakes: **Drop** to your hands and knees, **Cover** your head and neck, and **Hold On** until the shaking stops.

Color the safe choices. Put an X on the unsafe ones.

drop to your hands and knees	~~run outside while it shakes~~	cover your head and neck
~~ride in an elevator~~	hold on to a sturdy desk	~~stand next to a tall bookcase~~
stay away from windows	~~stand at a window to watch~~	stay put until the shaking stops

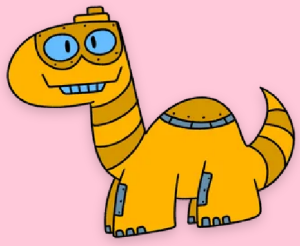
Where is the safest place in your classroom to drop, cover and hold on?

Art © Kevin Coulston

ANSWER KEY · VOLCANOES AND EARTHQUAKES · GRADES 4–5

Answer Key: Earth's Moving Plates

Answers for grown-ups. Some questions have more than one good answer.



Earth's crust is cracked into giant pieces called **plates**. They float on hot, soft rock and move all the time, a tiny bit each year.

Word bank

plates · slowly · earthquake · mountains · volcanoes · Ring of Fire

1. Fill in the blanks.

1. Earth's crust is broken into huge pieces called **plates**.
2. They move very **slowly**, about as fast as your fingernails grow.
3. When two plates slip suddenly, the ground shakes in an **earthquake**.
4. Plates pushing together for millions of years can build **mountains**.
5. Melted rock can rise up where plates meet and make **volcanoes**.
6. Many volcanoes circle the Pacific Ocean in the **Ring of Fire**.

2. Circle the answer.

Which tool measures earthquakes?

seismograph · thermometer · rain gauge

Are the plates moving right now?

yes · no

Art © Kevin Coulston

ANSWER KEY · HEAT AND TEMPERATURE · GRADES K–2

Answer Key: Hot or Cold?

Answers for grown-ups. Some questions have more than one good answer.



Glue each card under hot or cold.

Hot	Cold
soup	ice cream
the sun	snow
a campfire	a popsicle
an oven	an ice cube
hot cocoa	a freezer

✂ Cut out the cards on the dashed lines.

a campfire	hot cocoa	soup	ice cream	a freezer
an ice cube	an oven	a popsicle	snow	the sun

Art © Kevin Coulston

ANSWER KEY · HEAT AND TEMPERATURE · GRADES 1–3

Answer Key: What Gives Off Heat?

Answers for grown-ups. Some questions have more than one good answer.



Color the 7 things that give off heat. Put an X on the 5 that do not.

the sun	an ice cube	a campfire	a snowball
a stove	a toaster	a glass of cold water	a hair dryer
your body	a book	rubbing your hands together	a frozen pea

Word bank

friction · heat · sun

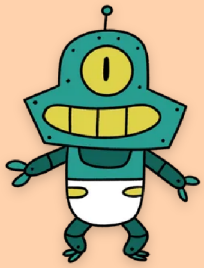
1. Our biggest source of heat is the sun.
2. Rubbing your hands together makes them warm because of friction.
3. A stove gives off heat to cook food.

Art © Kevin Coulston

ANSWER KEY · HEAT AND TEMPERATURE · GRADES 4–5

Answer Key: Conduction, Convection or Radiation?

Answers for grown-ups. Some questions have more than one good answer.



Heat moves in three ways. **Conduction:** heat moves through things that touch. **Convection:** warm air or water rises and moves around. **Radiation:** heat travels through space as rays, like sunshine.

Write each example in the right column.

a hot air balloon rising · warming your hands near a campfire · warm air rising from a heater · touching a hot pan · an ice cube melting in your hand · water swirling as it boils in a pot · feeling the sun warm your face · a heat lamp keeping chicks warm · a spoon heating up in hot soup

Conduction	Convection	Radiation
a spoon heating up in hot soup	warm air rising from a heater	feeling the sun warm your face
touching a hot pan	water swirling as it boils in a pot	warming your hands near a campfire
an ice cube melting in your hand	a hot air balloon rising	a heat lamp keeping chicks warm

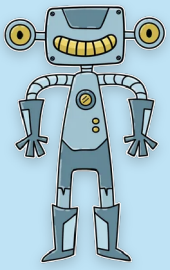
Which way does heat get from the sun to Earth?

Art © Kevin Coulston

ANSWER KEY · ENERGY · GRADES 3–5

Answer Key: Forms of Energy

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each form of energy to an example.

light energy	a flashlight shining in the dark
sound energy	a drum being played
heat energy	a warm stove
electrical energy	a cord powering a TV
motion energy	a ball rolling across the floor
chemical energy	food in your lunchbox

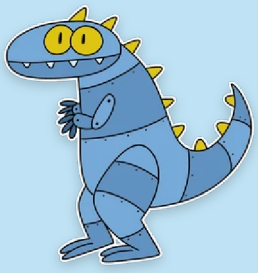
Name two forms of energy you used this morning.

Art © Kevin Coulston

ANSWER KEY · ENERGY · GRADES 3–5

Answer Key: Potential or Kinetic Energy?

Answers for grown-ups. Some questions have more than one good answer.



Potential energy is stored energy, waiting to be used. **Kinetic energy** is the energy of something moving.

Write each example in the right column.

a running dog · a ball rolling down a hill · falling rain · a stretched rubber band · a book on a high shelf · a roller coaster at the very top · a pulled-back bow and arrow · wind blowing · a moving car · a ball at the top of a hill

Potential (stored)	Kinetic (moving)
a ball at the top of a hill	a ball rolling down a hill
a stretched rubber band	a running dog
a book on a high shelf	wind blowing
a roller coaster at the very top	falling rain
a pulled-back bow and arrow	a moving car

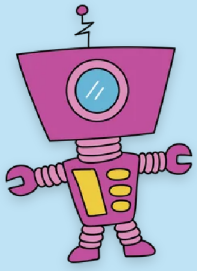
When does a swing have the most potential energy? When does it have the most kinetic energy?

Art © Kevin Coulston

ANSWER KEY · ENERGY · GRADES 4–5

Answer Key: Energy Changes

Answers for grown-ups. Some questions have more than one good answer.



Energy is never used up. It changes from one form to another.

Word bank

heat · light · sound · motion · electrical

Fill in the blanks. You can use a word more than once.

1. A toaster changes electrical energy into **heat** energy.
2. A flashlight changes the stored energy in its batteries into **light** energy.
3. Hitting a drum changes motion energy into **sound** energy.
4. A solar panel changes sunlight into **electrical** energy.
5. A fan changes electrical energy into **motion** energy.
6. A campfire changes the stored energy in wood into heat and **light**.

Think of one more thing that changes energy. What does it change?

Art © Kevin Coulston

ANSWER KEY · MIXTURES AND CHANGES · GRADES 3–5

Answer Key: Mixture or Solution?

Answers for grown-ups. Some questions have more than one good answer.



In a **mixture**, you can still see the different parts and pick them apart. A **solution** is a mixture where one thing dissolves into another so evenly you cannot see it any more.

Write each one in the right column.

lemonade · salt water · drink mix in water · a salad · sand and water · cereal and milk · beads and buttons · sugar stirred into tea · vinegar · trail mix

Mixture	Solution
trail mix	salt water
a salad	lemonade
sand and water	sugar stirred into tea
cereal and milk	drink mix in water
beads and buttons	vinegar

How could you get the salt back out of salt water?

Art © Kevin Coulston

ANSWER KEY · MIXTURES AND CHANGES · GRADES 3–5

Answer Key: Physical or Chemical Change?

Answers for grown-ups. Some questions have more than one good answer.



A **physical change** changes how something looks, but it is still the same stuff, like cutting paper. A **chemical change** makes a brand new substance, like a cake baking.

Write each change in the right column.

burning wood · baking a cake · frying an egg · melting ice · crushing a can · dissolving sugar in water · folding a shirt · a bike chain rusting · a banana turning brown · cutting paper

Physical change	Chemical change
cutting paper	baking a cake
melting ice	burning wood
crushing a can	a bike chain rusting
dissolving sugar in water	frying an egg
folding a shirt	a banana turning brown

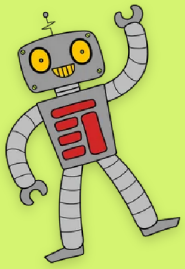
Pick one chemical change. How do you know a new substance was made?

Art © Kevin Coulston

ANSWER KEY · MIXTURES AND CHANGES · GRADES 3–5

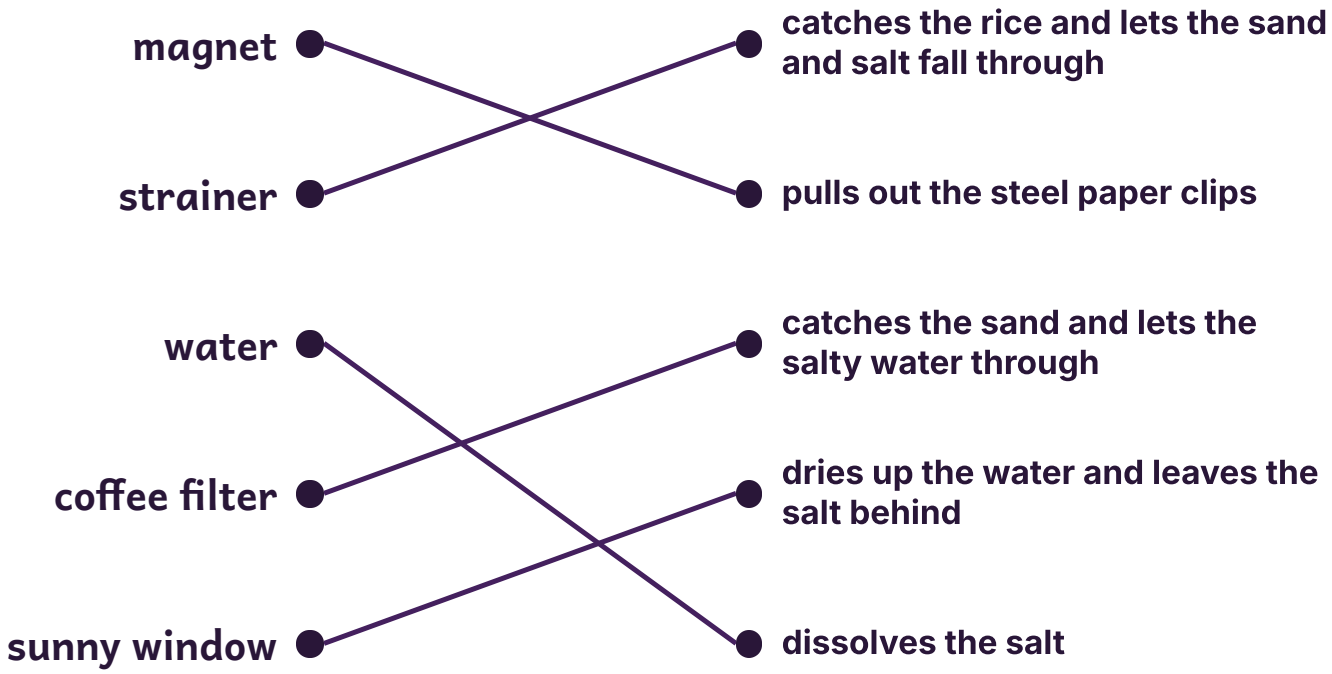
Answer Key: Separate a Mixture

Answers for grown-ups. Some questions have more than one good answer.



Someone mixed **sand, salt, rice and steel paper clips** in one jar. Scientists separate mixtures by using what is different about each part.

1. Draw a line from each tool to its job.



2. Number the steps in order.

3 Stir the sand and salt into water.

1 Use the magnet to pull out the paper clips.

5 Set the salty water in the sun until the water is gone.

2 Pour the rest through a strainer to catch the rice.

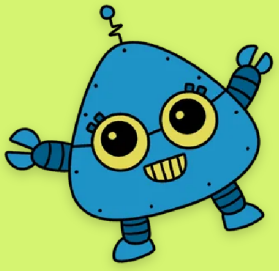
4 Pour the water through a coffee filter to catch the sand.

Art © Kevin Coulston

ANSWER KEY · MIXTURES AND CHANGES · GRADES 4–5

Answer Key: Chemistry Words

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each word to its meaning.

mixture	two or more things put together that keep their own properties
solution	a mixture where one thing dissolves evenly in another
dissolve	to break up and spread out in a liquid
physical change	a change in size, shape or state, not a new substance
chemical change	a change that makes a new substance
evaporate	to change from a liquid into a gas

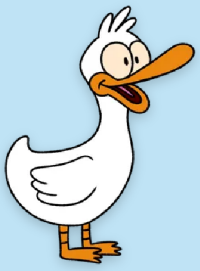
Use two of the words in a sentence about cooking.

Art © Kevin Coulston

ANSWER KEY · SINK OR FLOAT · GRADES K–2

Answer Key: Sink or Float Sort

Answers for grown-ups. Some questions have more than one good answer.



Glue each card under sinks or floats.

Sinks	Floats
a rock	a feather
a coin	a rubber duck
a key	a leaf
a marble	a cork
a metal spoon	an apple

✂ Cut out the cards on the dashed lines.

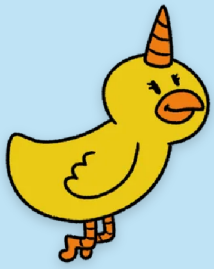
a coin	a leaf	a key	a rubber duck	an apple
a cork	a marble	a feather	a rock	a metal spoon

Art © Kevin Coulston

ANSWER KEY · SINK OR FLOAT · GRADES 1–3

Answer Key: Floating: True or False?

Answers for grown-ups. Some questions have more than one good answer.



Circle True or False.

Heavy things always sink.	True	**False**
Changing an object's shape can change whether it floats.	**True**	False
Things float more easily in salt water.	**True**	False
Air inside something can help it float.	**True**	False
All metal things sink.	True	**False**
Most wood floats.	**True**	False
An apple floats in water.	**True**	False

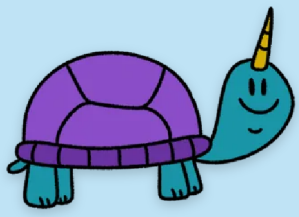
A huge steel ship weighs more than a car. How can it float?

Art © Kevin Coulston

ANSWER KEY · SINK OR FLOAT · GRADES 3–5

Answer Key: Liquid Density Tower

Answers for grown-ups. Some questions have more than one good answer.



You need: a tall clear cup, honey, dish soap, water (with a drop of food coloring) and vegetable oil.
Do it: slowly pour the same amount of each liquid into the cup, one at a time, down the side. Wait and watch. Heavier (denser) liquids sink to the bottom.

1. Write 1 for the bottom layer up to 4 for the top layer.

3 water

1 honey

4 vegetable oil

2 dish soap

2. Draw and color your tower. Label each layer.

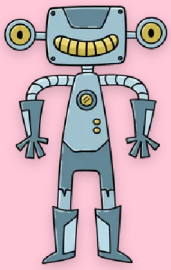
3. Why do you think the liquids stay in layers?

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ANSWER KEY · ENGINEERING DESIGN · GRADES 2–4

Answer Key: The Engineering Design Process

Answers for grown-ups. Some questions have more than one good answer.



Engineers solve problems by designing things. They follow these steps, and they go around again and again until the design works well.

1. Number the steps from 1 to 5.

4 Create: build your design.

1 Ask: what is the problem? What do I need?

5 Improve: test it, then make it better.

3 Plan: draw your best idea and list the materials.

2 Imagine: think of lots of ideas.

2. Think of a problem at school. What could an engineer design to fix it?

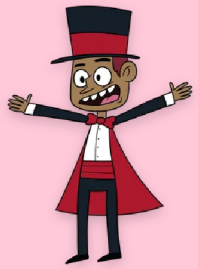
3. Draw your idea.

Art © Kevin Coulston

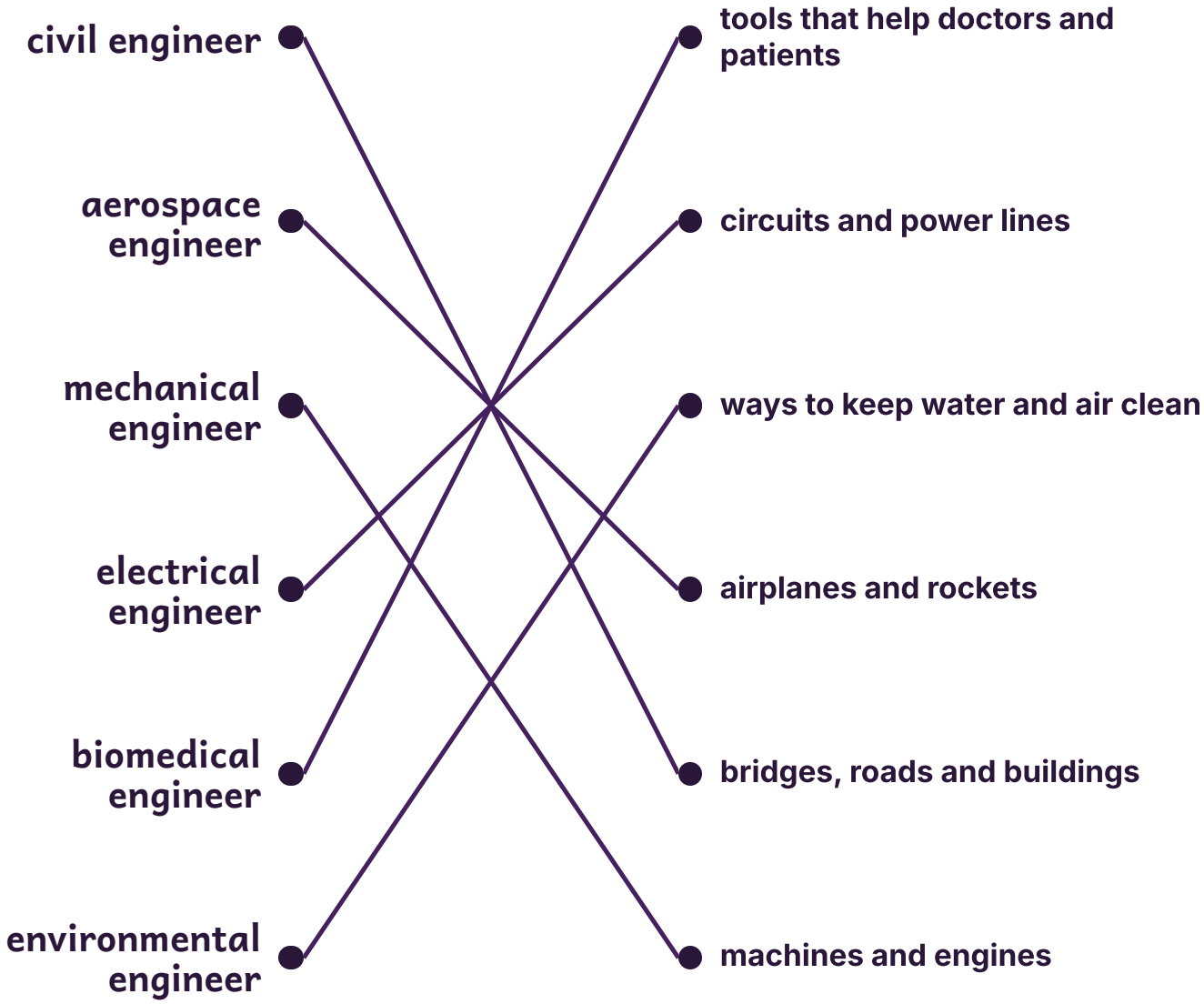
ANSWER KEY · ENGINEERING DESIGN · GRADES 3–5

Answer Key: Kinds of Engineers

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each engineer to what they design.



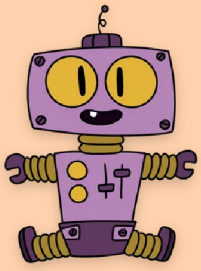
Which kind of engineer would you like to be? What would you design?

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ANSWER KEY · CODING UNPLUGGED · GRADES 1–3

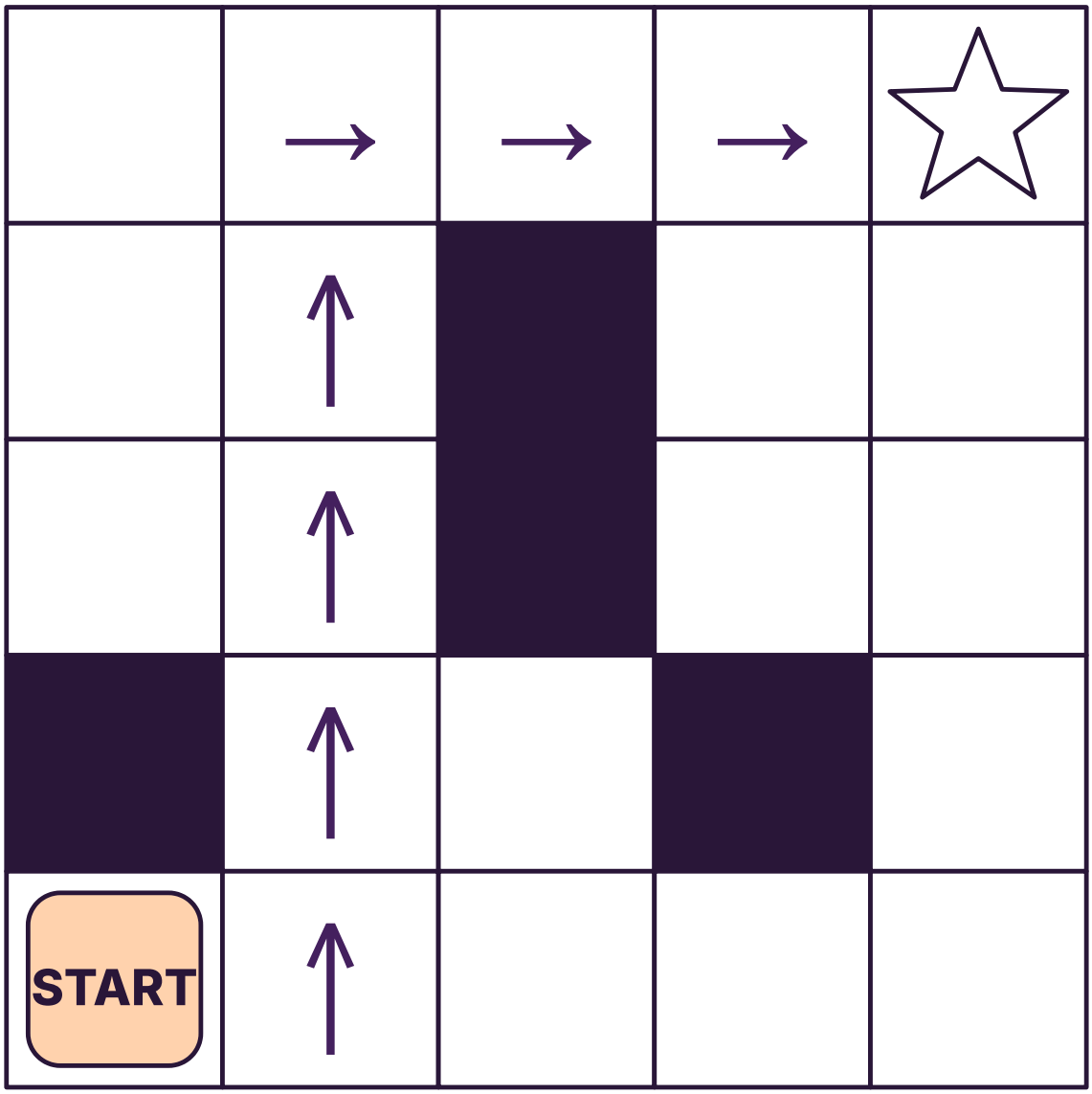
Answer Key: Code the Robot

Answers for grown-ups. Some questions have more than one good answer.



Computers follow code one step at a time. Each arrow moves the robot **one square**: ↑ up, ↓ down, ← left, → right.

Write the arrows that take the robot from START to the star. Do not go through the dark squares.



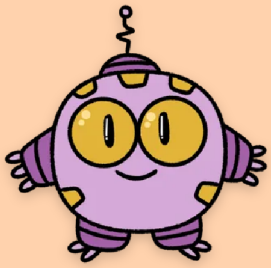
1 → 2 ↑ 3 ↑ 4 ↑ 5 ↑ 6 → 7 → 8 →

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ANSWER KEY · CODING UNPLUGGED · GRADES 2–4

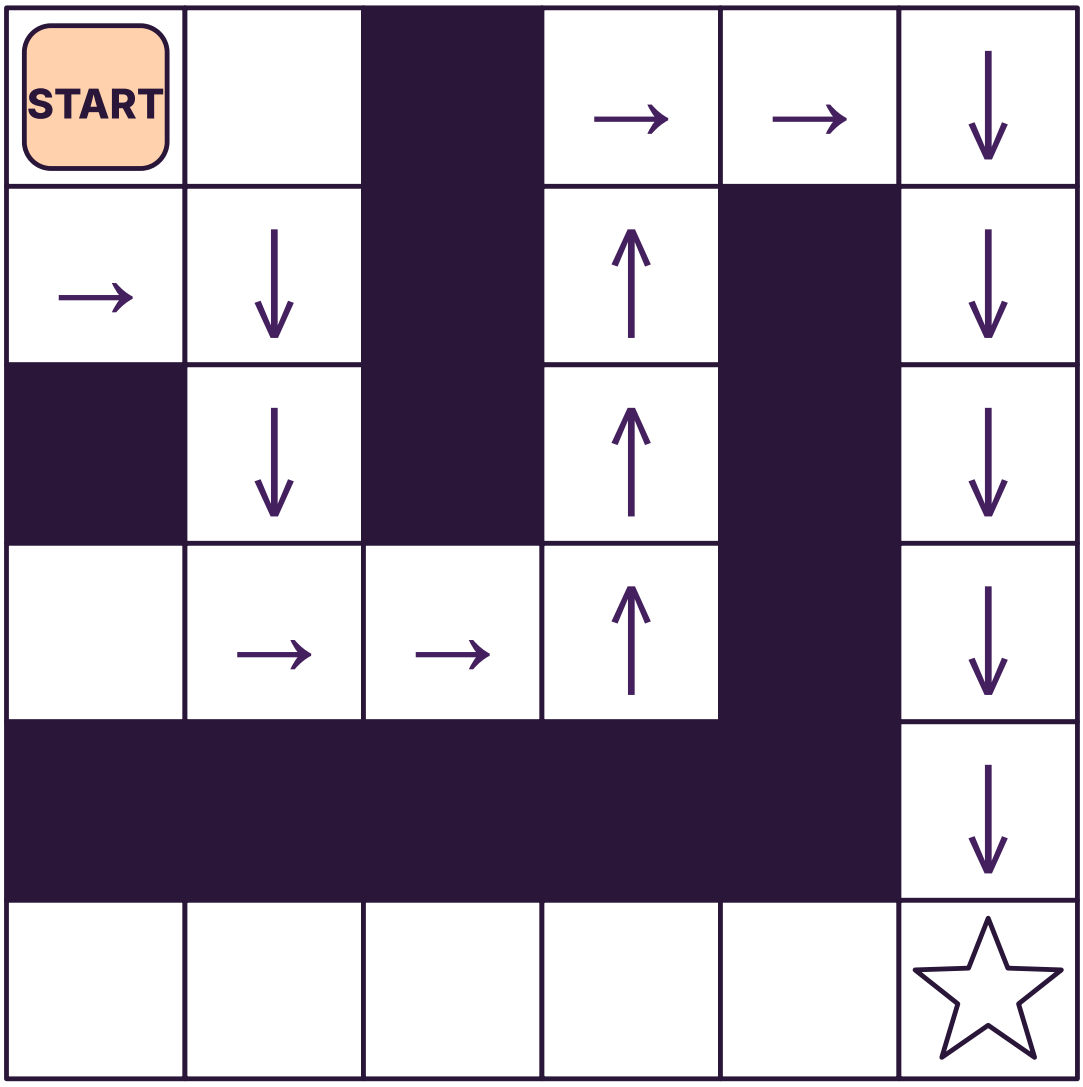
Answer Key: Robot Maze

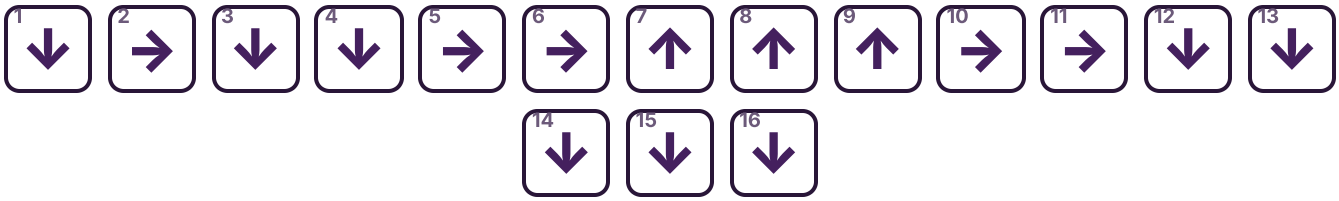
Answers for grown-ups. Some questions have more than one good answer.



Each arrow moves the robot **one square**: ↑ up, ↓ down, ← left, → right. The robot cannot go through walls.

Write the code to get the robot through the maze to the star.



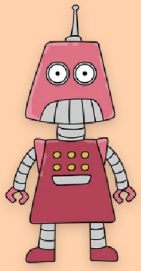


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ANSWER KEY · CODING UNPLUGGED · GRADES K–2

Answer Key: Put the Algorithm in Order

Answers for grown-ups. Some questions have more than one good answer.



An **algorithm** is a list of steps in the right order. A computer needs every step, in order, to do a job.

1. Brushing your teeth: number the steps from 1 to 6.

4 Spit into the sink.

1 Pick up your toothbrush.

6 Put the toothbrush away.

3 Brush the top and bottom teeth.

2 Squeeze toothpaste onto the brush.

5 Rinse the toothbrush.

2. Planting a seed: number the steps from 1 to 4.

4 Water it.

1 Dig a small hole.

3 Cover the seed with soil.

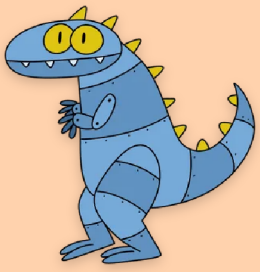
2 Drop in a seed.

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ANSWER KEY · CODING UNPLUGGED · GRADES 2–5

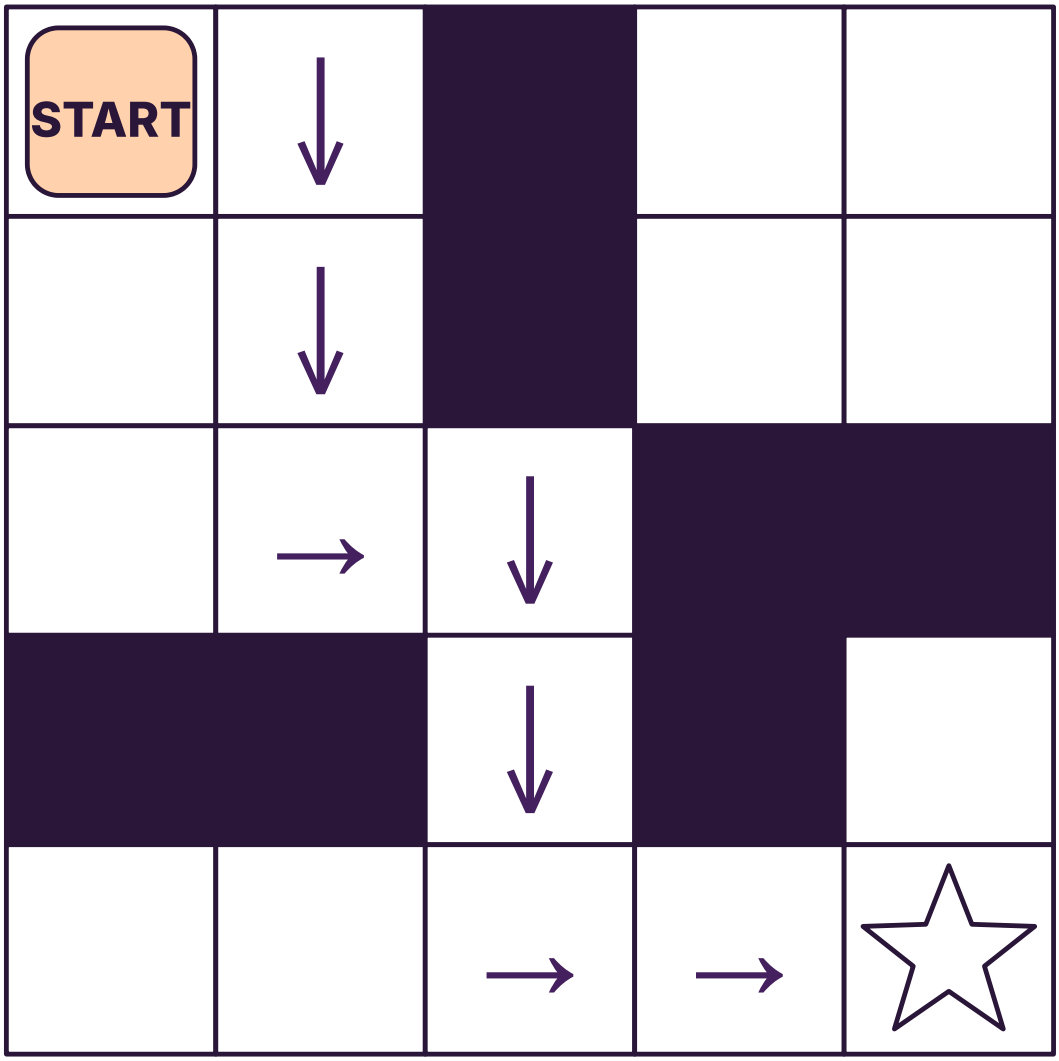
Answer Key: Find the Bug

Answers for grown-ups. Some questions have more than one good answer.



A mistake in code is called a **bug**. Fixing it is called **debugging**. Follow this code with your finger. One arrow sends the robot the wrong way.

Follow the code from START. Find the step that goes wrong.



1 → 2 ↓ 3 ↓ 4 → 5 → 6 ↓ 7 → 8 →

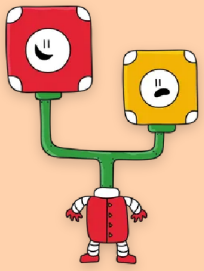
The bug is in step number 5 **The arrow should be** ↓ (down)

Art © Kevin Coulston

ANSWER KEY · CODING UNPLUGGED · GRADES 3–5

Answer Key: Write Your Name in Binary

Answers for grown-ups. Some questions have more than one good answer.



Computers store everything as **1s and 0s**, called **binary code**. In this code, every letter is five 1s and 0s.

Word bank

A 00001 · B 00010 · C 00011 · D 00100 · E 00101 · F 00110
G 00111 · H 01000 · I 01001 · J 01010 · K 01011 · L 01100
M 01101 · N 01110 · O 01111 · P 10000 · Q 10001 · R 10010
S 10011 · T 10100 · U 10101 · V 10110 · W 10111 · X 11000
Y 11001 · Z 11010

1. Decode the words.

00011 00001 10100 CAT

00100 01111 00111 DOG

2. Write your first name in binary code, one letter on each line.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Art © Kevin Coulston

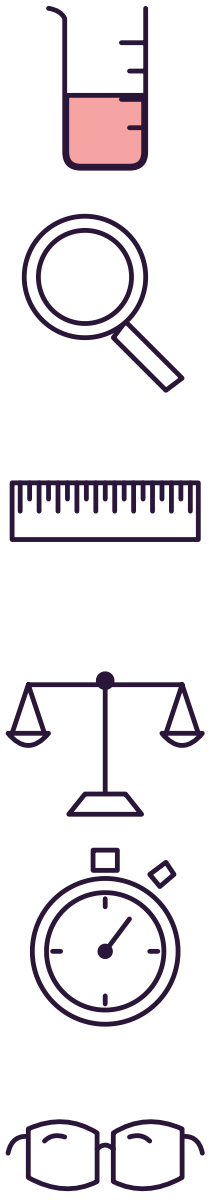
ANSWER KEY · SCIENCE TOOLS AND LAB SAFETY · GRADES 1–4

Answer Key: Science Tools

Answers for grown-ups. Some questions have more than one good answer.



Draw a line from each tool to its job.



- protects your eyes
- measures how much time something takes
- makes small things look bigger
- holds, measures and pours liquids
- measures how long something is
- compares how heavy things are

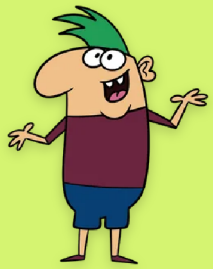
Which tool would you use to time a race?

Art © Kevin Coulston

ANSWER KEY · SCIENCE TOOLS AND LAB SAFETY · GRADES 1–5

Answer Key: Lab Safety

Answers for grown-ups. Some questions have more than one good answer.



Color the safe choices. Put an X on the unsafe ones.

wear goggles when your teacher says to	~~taste what you are testing~~	tie back long hair
~~run around the room~~	wash your hands after an experiment	~~mix things just to see what happens~~
tell a grown-up if something spills or breaks	~~pick up broken glass~~	follow the steps in order
~~eat a snack at the science table~~	clean up when you are done	~~rub your eyes while you work~~

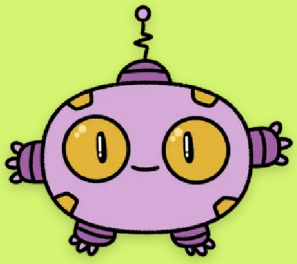
The safety rule I think matters most, and why:

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ANSWER KEY · SCIENCE TOOLS AND LAB SAFETY · GRADES 2–5

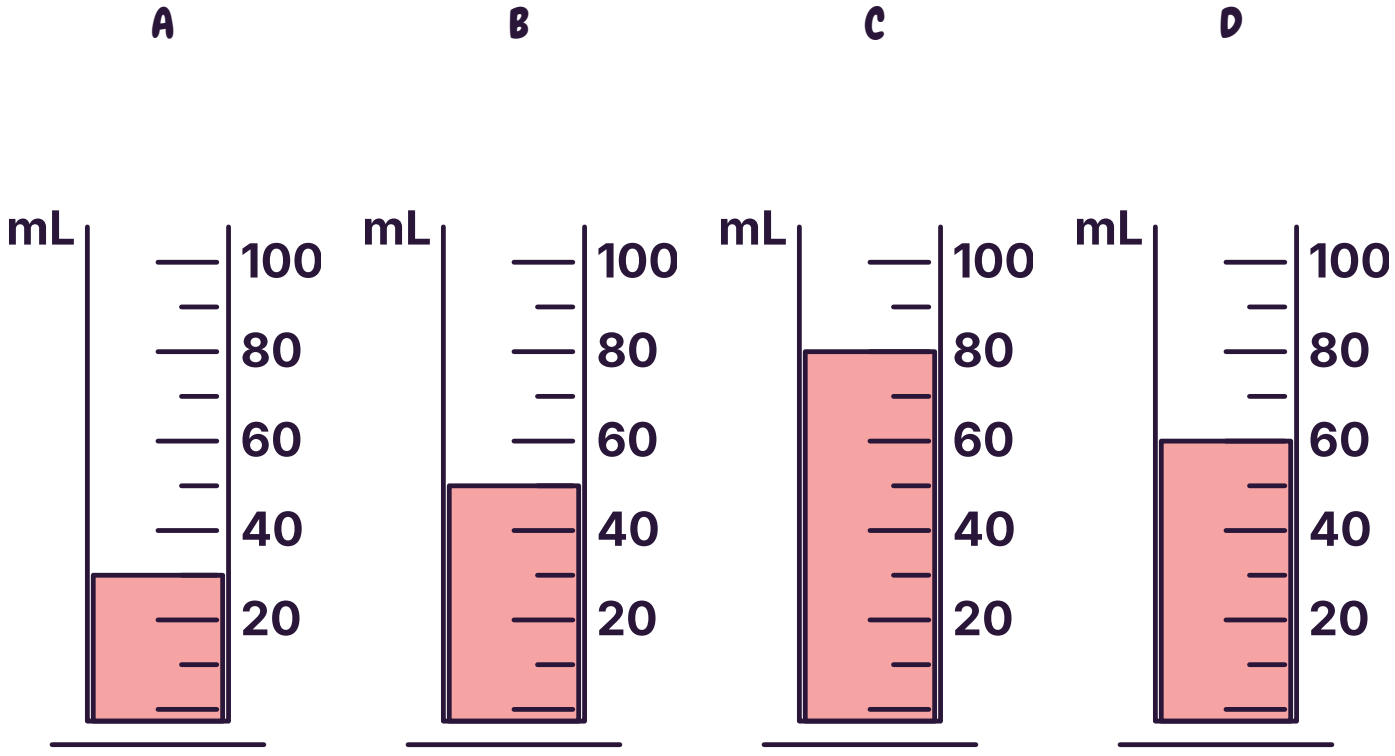
Answer Key: Read a Measuring Cylinder

Answers for grown-ups. Some questions have more than one good answer.



Scientists measure liquids in **milliliters (mL)**. Read the number at the top of the water. Each small line is 10 mL.

1. Write how much water is in each cylinder.



30 mL

50 mL

80 mL

60 mL

2. Answer the questions.

Which cylinder has the most water? C

How much more water is in C than in A? 50 mL

If you pour A and B together, how much water is there? 80 mL

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