

4th GRADE

# Science Investigation Pack



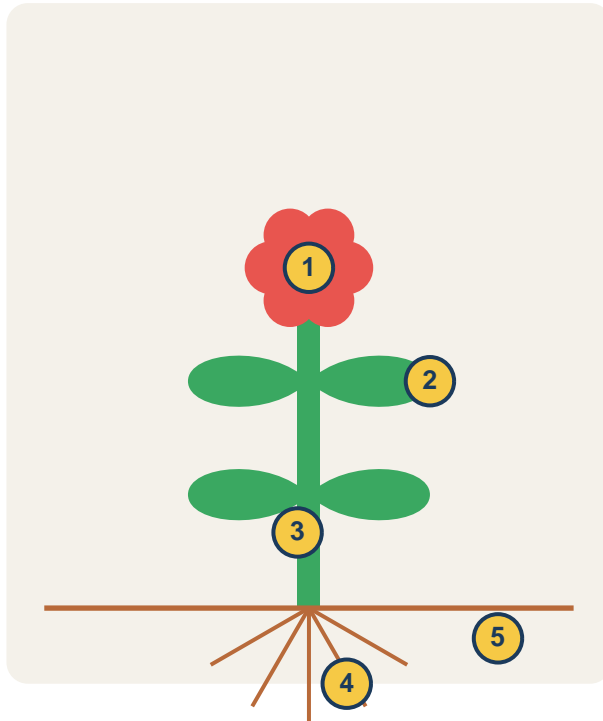
**20 Worksheets • 4 Quizzes • Answer Key**

*Life Science • Earth Science • Physical Science • Scientific Method*

[worksheetgalaxy.com](https://www.worksheetgalaxy.com)

# Parts of a Plant

Label the diagram. Then explain each part's job.



Write the part:

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

**Word Bank:** roots - stem - leaves - flower - soil

Draw a line to match each part to its job:

Roots

Stem

Leaves

● carry water and food up the plant.

● make food using sunlight (photosynthesis).

● soak up water and minerals from the soil.

# Animal Classification

Sort animals into the correct vertebrate group.

**Vertebrate Groups**

**Mammals:** have fur or hair, breathe air, give birth to live young, and feed milk to babies.

**Birds:** have feathers, two legs, two wings, and lay eggs with hard shells.

**Reptiles:** have dry, scaly skin, breathe air, and most lay eggs with leathery shells.

**Amphibians:** have moist skin, live in water as babies and on land as adults (e.g., frogs).

**Fish:** live in water, breathe through gills, and have scales and fins.

Sort each animal into its group. Write the animal in the correct column.

Mammals	Birds	Reptiles	Amphibians	Fish

**Animals to sort:**  
 dog, eagle, snake, frog, salmon, lizard, dolphin, owl, salamander,  
 trout, bat, parrot, turtle, toad, shark

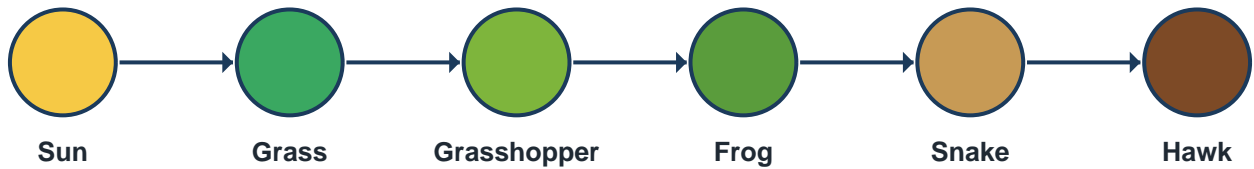
# Food Chains

Energy flows from the sun → plants → animals.

## Key Terms

- Producer:** a living thing that makes its own food (plants).
- Consumer:** a living thing that eats other living things to get energy.
- Herbivore:** a consumer that eats only plants.
- Carnivore:** a consumer that eats only meat (other animals).
- Omnivore:** a consumer that eats both plants and meat.
- Decomposer:** breaks down dead plants and animals (e.g., fungi, worms).

## Example: A meadow food chain



1. Who is the PRODUCER in this food chain?  
\_\_\_\_\_
2. Name TWO consumers in this food chain.  
\_\_\_\_\_
3. What would happen to the snake population if all the frogs disappeared? Why?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Ecosystems

*Living and non-living things working together.*

**Ecosystem:** All the living things (biotic) and non-living things (abiotic) in an area.

Biotic = living: plants, animals, fungi, bacteria.

Abiotic = non-living: water, sunlight, soil, rocks, air, temperature.

Sort each item below as Biotic (B) or Abiotic (A).

oak tree	<input type="text"/>	sunlight	<input type="text"/>	deer	<input type="text"/>
	<i>B or A</i>		<i>B or A</i>		<i>B or A</i>
rock	<input type="text"/>	water	<input type="text"/>	mushroom	<input type="text"/>
	<i>B or A</i>		<i>B or A</i>		<i>B or A</i>
soil	<input type="text"/>	earthworm	<input type="text"/>	air	<input type="text"/>
	<i>B or A</i>		<i>B or A</i>		<i>B or A</i>
lily pad	<input type="text"/>	temperature	<input type="text"/>	moss	<input type="text"/>
	<i>B or A</i>		<i>B or A</i>		<i>B or A</i>

1. Pick an ecosystem (forest, ocean, desert, pond). Name TWO biotic and TWO abiotic parts.

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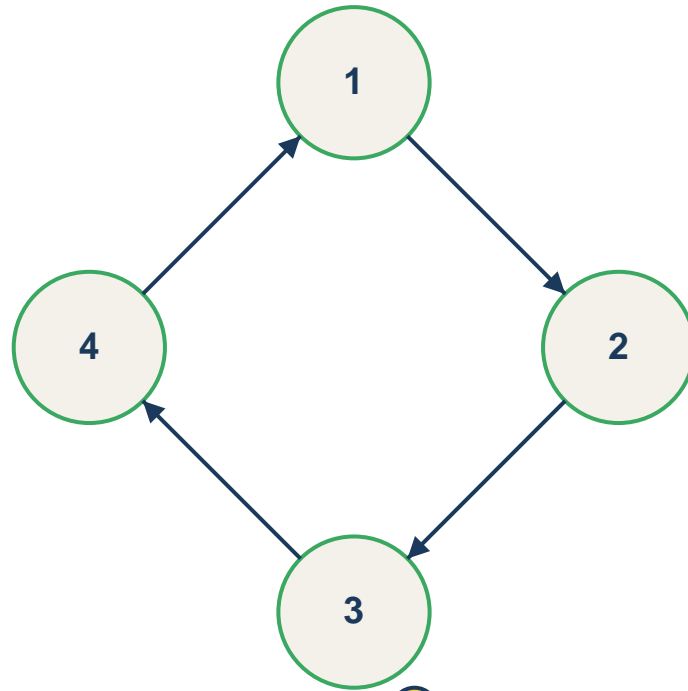
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# Life Cycles

*Different living things grow in different stages.*

## 1. Label the stages of the butterfly life cycle.



① \_\_\_\_\_

② \_\_\_\_\_

③ \_\_\_\_\_

④ \_\_\_\_\_

**Word Bank:** egg - caterpillar - chrysalis - butterfly

## 2. How is a frog's life cycle DIFFERENT from a butterfly's life cycle?

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# Life Science Quiz

Name: \_\_\_\_\_

Score: \_\_\_\_ / \_\_\_\_

- Which part of a plant absorbs water and minerals from the soil?  
 A Leaves  
 B Stem  
 C Roots  
 D Flower
- Which group has feathers, two legs, two wings, and lays eggs?  
 A Mammals  
 B Birds  
 C Reptiles  
 D Fish
- In a food chain, which living thing makes its own food?  
 A Carnivore  
 B Herbivore  
 C Producer  
 D Decomposer
- Which of these is an ABIOTIC part of an ecosystem?  
 A Earthworm  
 B Sunlight  
 C Oak tree  
 D Mushroom
- Which is the CORRECT order of the butterfly life cycle?  
 A Egg → caterpillar → chrysalis → butterfly  
 B Egg → butterfly → chrysalis → caterpillar  
 C Caterpillar → egg → butterfly → chrysalis  
 D Butterfly → egg → chrysalis → caterpillar
- Explain why decomposers are important to an ecosystem.  

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# Layers of the Earth

Label and learn about Earth's four main layers.

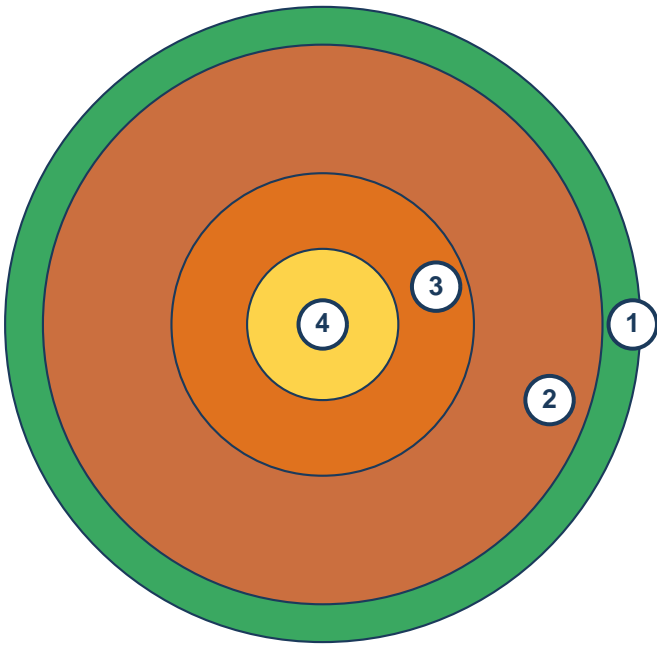
Label each layer:

① \_\_\_\_\_  
*(Thin, rocky outer layer.)*

② \_\_\_\_\_  
*(Hot, slow-flowing rock.)*

③ \_\_\_\_\_  
*(Liquid metal (iron + nickel).)*

④ \_\_\_\_\_  
*(Solid metal at Earth's center.)*



**Word Bank:** Crust - Mantle - Outer Core - Inner Core

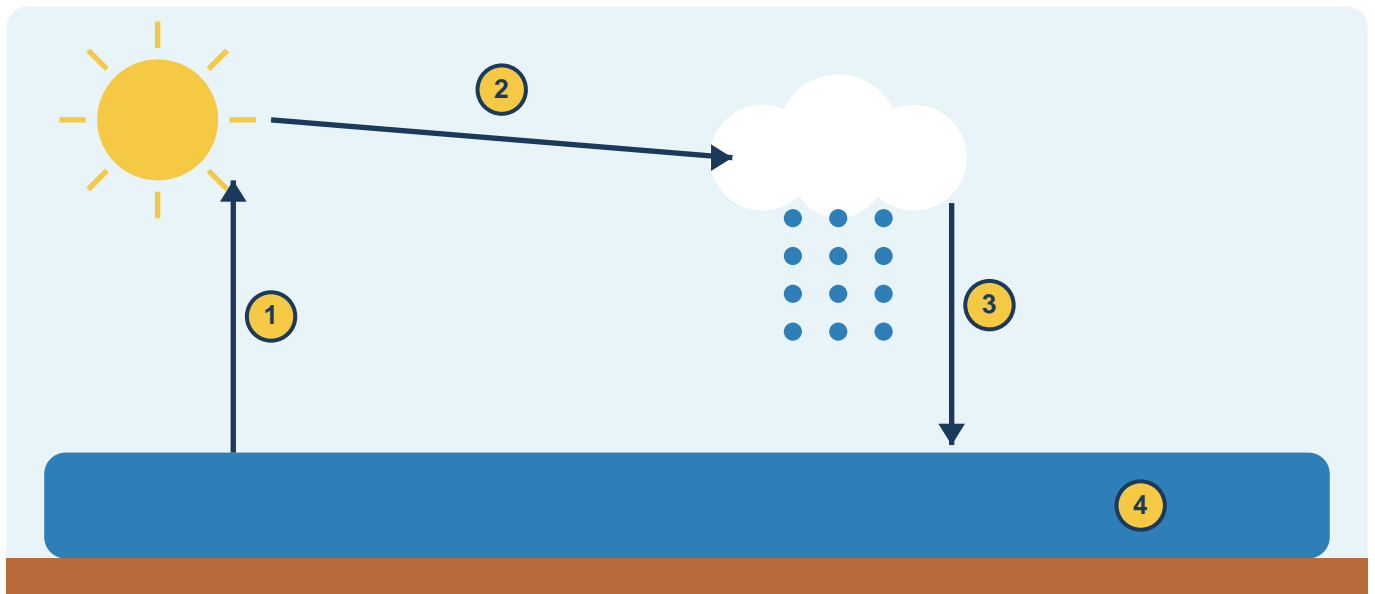
1. Which layer of the Earth is the HOTTEST? Which is the THINNEST?

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# The Water Cycle

Water moves between the ground, sky, and back again.



Match each number with the correct stage:

**Evaporation:** water heats up and turns into water vapor (gas).

**Condensation:** water vapor cools and forms tiny water droplets (clouds).

**Precipitation:** water falls back to Earth as rain, snow, sleet, or hail.

**Collection:** water collects in oceans, lakes, rivers, and underground.

# Rocks & Minerals

Three types of rocks form in different ways.

## Igneous

Forms when MELTED rock (magma or lava) cools and hardens.

**Examples:**  
granite, basalt, obsidian

## Sedimentary

Forms when LAYERS of sand, mud, or shells press together over time.

**Examples:**  
sandstone, limestone, shale

## Metamorphic

Forms when other rocks change because of heat and pressure deep underground.

**Examples:**  
marble, slate, gneiss

Sort each rock. Write I (Igneous), S (Sedimentary), or M (Metamorphic).

granite

marble

sandstone

basalt

limestone

slate

obsidian

shale

gneiss

# Weather

*Tools, terms, and your weekly weather log.*

## Weather Tools & Terms

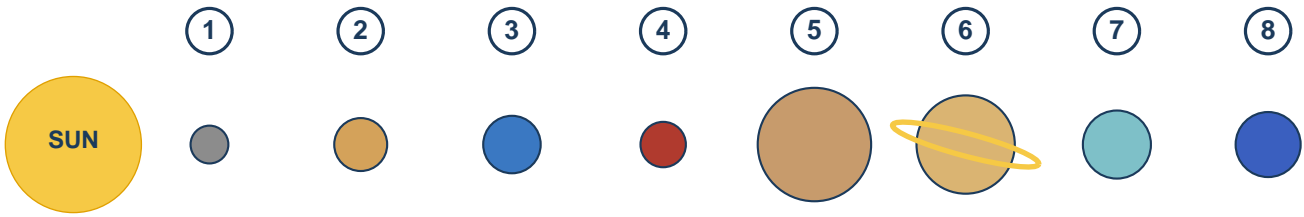
- Thermometer:** measures TEMPERATURE (how hot or cold).
- Barometer:** measures AIR PRESSURE (changes predict storms).
- Anemometer:** measures WIND SPEED (cups spin in the wind).
- Rain Gauge:** measures how much PRECIPITATION fell.
- Wind Vane:** shows WIND DIRECTION.
- Hygrometer:** measures HUMIDITY (water in the air).

## My Weekly Weather Log

Day	Temperature	Sky / Clouds	Wind	Precipitation
Mon				
Tues				
Wed				
Thurs				
Fri				
Sat				
Sun				

# The Solar System

Eight planets orbit our sun. Can you put them in order?



**Word Bank:** Mars - Jupiter - Earth - Saturn - Mercury - Venus - Neptune - Uranus

Label each planet (closest to sun = 1, farthest = 8):

① \_\_\_\_\_      ② \_\_\_\_\_      ③ \_\_\_\_\_      ④ \_\_\_\_\_  
⑤ \_\_\_\_\_      ⑥ \_\_\_\_\_      ⑦ \_\_\_\_\_      ⑧ \_\_\_\_\_

1. Which planet is the LARGEST? Which is closest to the sun?

\_\_\_\_\_  
\_\_\_\_\_

# Earth Science Quiz

Name: \_\_\_\_\_

Score: \_\_\_\_ / \_\_\_\_

- Which is the THINNEST layer of the Earth?
  - Inner core
  - Outer core
  - Mantle
  - Crust
- What stage of the water cycle is when water turns from a liquid into a gas?
  - Condensation
  - Precipitation
  - Evaporation
  - Collection
- Which type of rock is formed from cooled magma or lava?
  - Sedimentary
  - Igneous
  - Metamorphic
  - Mineral
- Which weather tool measures wind speed?
  - Thermometer
  - Barometer
  - Anemometer
  - Rain gauge
- Which planet is the THIRD planet from the sun?
  - Venus
  - Earth
  - Mars
  - Jupiter
- Describe the water cycle in your own words. Use these words: evaporation, condensation, precipitation.

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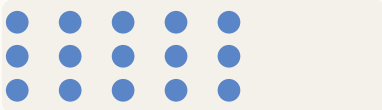
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# States of Matter


Solids, liquids, and gases — and how they change.

**Solid**




Has a fixed shape and fixed volume.  
Particles packed tightly, vibrating in place.  
**Examples: ice, rock, wood**

**Liquid**



Takes the shape of its container; fixed volume.  
Particles slide past each other.  
**Examples: water, milk, juice**

**Gas**



No fixed shape; no fixed volume.  
Particles move fast and spread out to fill space.  
**Examples: air, steam, helium**

Write **S** (Solid), **L** (Liquid), or **G** (Gas) for each:

a brick

milk in a glass

air in a balloon

a wooden chair

steam from a kettle

syrup

an ice cube

oxygen

honey

# Forces & Motion

*A force is a push or a pull that can change motion.*

## Key Terms

**Force:** a push or pull on an object.

**Gravity:** a force that pulls objects toward Earth.

**Friction:** a force that slows things down when they rub together.

**Motion:** when an object changes position over time.

**Speed:** how fast something moves (distance  $\div$  time).

Is each example a **PUSH** or a **PULL**? Circle the answer.

Opening a drawer

PUSH  PULL

Kicking a soccer ball

PUSH  PULL

Lifting a backpack

PUSH  PULL

Closing a door

PUSH  PULL

Throwing a basketball

PUSH  PULL

Pulling a wagon

PUSH  PULL

1. Why is it harder to slide a book on a rough carpet than on a smooth floor?

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# Simple Machines

*Tools that make work easier!*

## Lever



A bar that turns on a fixed point (fulcrum).

**Examples:** seesaw, crowbar

## Pulley



A wheel with a rope to lift things.

**Examples:** flagpole, blinds

## Wheel & Axle



A wheel attached to a rod that turns together.

**Examples:** doorknob, car wheels

## Inclined Plane



A slanted surface that lifts loads.

**Examples:** ramp, slide

## Wedge



A tool that splits or cuts.

**Examples:** knife, axe

## Screw



An inclined plane wrapped around a pole.

**Examples:** jar lid, screw

# Forms of Energy

*Energy can be many things — and it can change form!*

## Six Forms of Energy

**Light:** energy we can see (sun, light bulbs, fire).

**Heat (Thermal):** energy from hot things (stove, sun, body heat).

**Sound:** energy that travels in waves and we hear (music, voices).

**Electrical:** energy that flows through wires (lamps, computers).

**Mechanical:** energy of moving things (a rolling ball, a swinging swing).

**Chemical:** energy stored in food, batteries, and fuel.

**What FORM of energy is each? (Some have more than one!)**

A campfire (heat and \_\_\_\_)

A speaker playing music

A lit flashlight

A battery (stored energy)

A spinning fan

Lightning

# Magnets & Electricity

*Forces you can't see — but can definitely feel!*

## Magnet Facts

- Magnets have two ends called POLES (North and South).
- Opposite poles ATTRACT (pull together). Same poles REPEL (push away).
- Magnets attract objects made of iron, steel, nickel, and cobalt.
- A magnetic field is the area around a magnet where its force can act.

Will a magnet attract this object? Write YES or NO.

iron nail	<input type="text"/>	rubber eraser	<input type="text"/>
steel paperclip	<input type="text"/>	plastic spoon	<input type="text"/>
wooden ruler	<input type="text"/>	aluminum foil	<input type="text"/>
nickel coin	<input type="text"/>	glass marble	<input type="text"/>
copper wire	<input type="text"/>	cardboard	<input type="text"/>

# Physical Science Quiz

Name: \_\_\_\_\_

Score: \_\_\_\_ / \_\_\_\_

- Which state of matter has a fixed shape AND a fixed volume?  
 A Solid  
 B Liquid  
 C Gas  
 D Plasma
- Friction is a force that:  
 A pulls things toward Earth  
 B speeds objects up  
 C slows things down when they rub together  
 D is invisible and never affects anything
- A ramp is an example of which simple machine?  
 A Lever  
 B Pulley  
 C Wedge  
 D Inclined plane
- Which form of energy is stored in food and batteries?  
 A Light  
 B Sound  
 C Chemical  
 D Mechanical
- Two magnets that have the same pole near each other will:  
 A attract (pull together)  
 B repel (push apart)  
 C stick together permanently  
 D have no effect
- A book is sitting on a table. Name TWO forces acting on it. Explain.

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# The Scientific Method

*How real scientists answer questions.*

## 1. Question

Ask a question about something you observe.

*Example: Do plants grow taller in sunlight or shade?*

## 2. Research

Find out what is already known about your question.

*Read books or trusted websites.*

## 3. Hypothesis

Make a smart guess (your prediction).

*Example: "I think plants in sunlight will grow taller."*

## 4. Experiment

Test your hypothesis. Change ONE thing at a time.

*Use the same soil, water, and pots; only change the light.*

## 5. Observe & Record

Watch carefully. Write down what you see.

*Measure plant height every day for two weeks.*

## 6. Conclusion

Was your hypothesis correct? Explain what you learned.

*Use your data to answer your question.*

# Lab Safety

Stay safe before, during, and after every experiment.

**G**

Wear safety goggles when handling chemicals or sharp tools.

**L**

Always listen to your teacher's instructions.

**!**

Never eat or drink anything in the lab — even if it looks safe.

**F**

Clean up spills right away with help from a teacher.

**H**

Tie back long hair and roll up loose sleeves.

**W**

Wash your hands when you finish your experiment.

**X**

Never run in the lab. Walk carefully, especially with glass.

**N**

Always record what you do — even mistakes are useful data!

## My Lab Safety Pledge

I, \_\_\_\_\_, promise to follow all the lab safety rules.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# Lab Worksheet

*Use this template for your own experiment!*

## QUESTION

*What do you want to find out?*

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## HYPOTHESIS

*What do you think will happen? Use "If... then..." format.*

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## MATERIALS

*List everything you need.*

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## PROCEDURE

*Write the steps you will follow, in order.*

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# Results & Conclusion

*Record your data and explain what it means.*

## DATA TABLE

Trial #	Variable	Result	Notes

## OBSERVATIONS — what did you SEE, HEAR, or NOTICE?

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## CONCLUSION — was your hypothesis correct? Why or why not?

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# Science Journal

Write like a real scientist. Pick ONE prompt!

## Observation vs. Inference

OBSERVATION: something you can see, hear, smell, taste, or touch.

INFERENCE: an explanation or guess based on observations.

*Example - Observation: "The grass is wet." Inference: "It probably rained last night."*

## Choose ONE journal prompt:

Describe everything you observe outside your window. Then make THREE inferences.

Pick one object in your room. Write FIVE observations using different senses.

Describe a science experiment you'd like to try. What's your question and hypothesis?

Write about a time when you used the scientific method (even without realizing it!).

## My response:

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# Scientific Method & Mixed Review

Name: \_\_\_\_\_

Score: \_\_\_\_ / \_\_\_\_

- Which step comes FIRST in the scientific method?
  - Conclusion
  - Experiment
  - Question
  - Hypothesis
- A hypothesis is BEST described as:
  - a final answer
  - a careful guess you can test
  - a list of materials
  - a kind of measurement tool
- Which is an OBSERVATION (not an inference)?
  - The dog must be hungry.
  - The bowl is empty.
  - It probably rained.
  - She is happy.
- Which is the most important lab safety rule?
  - Run quickly between stations
  - Always follow your teacher's instructions
  - Eat snacks while you work
  - Skip cleanup if you're tired
- Maya wants to test if salt water freezes faster than fresh water. What is her hypothesis? (Use "If... then..." format.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- List TWO things Maya should keep the SAME in both cups so the test is fair.  
\_\_\_\_\_  
\_\_\_\_\_

# Answer Key — For Parents & Teachers

## Sheet 1 — Parts of a Plant

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**1. Flower 2. Leaf 3. Stem 4. Roots 5. Soil**

Match: Roots → soak up water and minerals - Stem → carry water/food up

Leaves → make food using sunlight (photosynthesis)

## Sheet 2 — Animal Classification

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**Mammals: dog, dolphin, bat**

**Birds: eagle, owl, parrot**

**Reptiles: snake, lizard, turtle**

**Amphibians: frog, salamander, toad**

**Fish: salmon, trout, shark**

## Sheet 3 — Food Chains

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1. Producer: Grass (the sun gives energy but is not living).

2. Two consumers (any two): Grasshopper, Frog, Snake, Hawk.

3. Sample answer: Snake population would shrink because frogs are their food source.

## Sheet 4 — Ecosystems

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**Biotic (B): oak tree, deer, mushroom, earthworm, lily pad, moss**

**Abiotic (A): sunlight, rock, water, soil, air, temperature**

1. Sample (forest): Biotic = oak, deer. Abiotic = sunlight, soil.

## Sheet 5 — Life Cycles

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**1. Egg → 2. Caterpillar → 3. Chrysalis → 4. Butterfly**

2. Sample answer: A frog hatches in water as a tadpole with a tail and gills, then grows legs and lungs to live on land. Butterflies have a chrysalis stage; frogs do not.

## Quiz 1 — Life Science

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**1. C (Roots) 2. B (Birds) 3. C (Producer) 4. B (Sunlight) 5. A**

6. Sample: Decomposers break down dead plants and animals. They return nutrients to the soil so plants can use them again, keeping the ecosystem healthy.

## Sheet 6 — Layers of the Earth

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**1. Crust 2. Mantle 3. Outer Core 4. Inner Core**

Hottest = Inner Core. Thinnest = Crust.

# Answer Key — For Parents & Teachers

## Sheet 7 — Water Cycle

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1. Evaporation 2. Condensation 3. Precipitation 4. Collection

## Sheet 8 — Rocks & Minerals

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**Igneous (I):** granite, basalt, obsidian

**Sedimentary (S):** sandstone, limestone, shale

**Metamorphic (M):** marble, slate, gneiss

## Sheet 9 — Weather

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Personal log; check that students used the correct tools/terms (temperature, clouds, wind, precipitation) for at least 5 days.

## Sheet 10 — The Solar System

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1. Mercury 2. Venus 3. Earth 4. Mars 5. Jupiter 6. Saturn 7. Uranus 8. Neptune

Largest = Jupiter. Closest to sun = Mercury.

## Quiz 2 — Earth Science

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1. D (Crust) 2. C (Evaporation) 3. B (Igneous) 4. C (Anemometer) 5. B (Earth)

6. Sample: The sun heats water in oceans/lakes; it evaporates into vapor.

The vapor cools and condenses into clouds. Water falls as precipitation (rain/snow) and collects back in lakes, rivers, and oceans, starting the cycle again.

## Sheet 11 — States of Matter

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**Solid (S):** a brick, a wooden chair, an ice cube

**Liquid (L):** milk, syrup, honey

**Gas (G):** air in a balloon, steam from a kettle, oxygen

## Sheet 12 — Forces & Motion

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**Push:** Kicking a soccer ball, Closing a door, Throwing a basketball

**Pull:** Opening a drawer, Lifting a backpack, Pulling a wagon

1. Sample: Carpet has more friction than a smooth floor because rough surfaces rub harder, slowing the book down more.

## Sheet 13 — Simple Machines

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Information sheet — no answers required. Use to discuss real-life examples.

## Sheet 14 — Forms of Energy

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**Campfire:** heat AND light (also sound)

**Speaker playing music:** sound (and electrical)

**Lit flashlight:** light (and electrical)

**Battery:** chemical (stored)

**Spinning fan:** mechanical (and electrical)

**Lightning:** electrical (also light, heat, sound)

# Answer Key — For Parents & Teachers

## Sheet 15 — Magnets & Electricity

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**YES (magnetic):** iron nail, steel paperclip, nickel coin

**NO (not magnetic):** rubber eraser, plastic spoon, wooden ruler, aluminum foil, glass marble, copper wire, cardboard

Note: True nickel attracts; modern "nickel" coins are mostly copper.

## Quiz 3 — Physical Science

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1. **A (Solid)** 2. **C (slows things down...)** 3. **D (Inclined plane)**

4. **C (Chemical)** 5. **B (repel — push apart)**

6. Sample: Gravity pulls the book down; the table pushes up (normal force).

These forces are balanced, so the book does not move.

## Sheet 16 — Scientific Method

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Recall the 6 steps in order:

**Question - Research - Hypothesis - Experiment - Observe & Record - Conclusion**

## Sheet 17 — Lab Safety

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Information + pledge sheet. No graded answers.

## Sheets 18 & 19 — Lab Worksheet Templates

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Open-ended templates. Check that students wrote a testable question, used

"If... then..." hypothesis, listed materials, numbered procedure, and a conclusion.

## Sheet 20 — Science Journal

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Open-ended. Look for clear separation of OBSERVATION and INFERENCE.

## Quiz 4 — Scientific Method & Mixed Review

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1. **C (Question)** 2. **B (a careful guess you can test)**

3. **B (The bowl is empty)** 4. **B (Follow teacher's instructions)**

5. Sample: "If I freeze salt water and fresh water at the same time, the fresh water will freeze faster." 6. Same cup size, water amount, freezer, start time.

## Tips for Parents & Teachers

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- Try one real experiment per unit — hands-on builds the strongest understanding.
- Encourage "why" questions; that's what real scientists do.
- Find more free packs at [worksheetgalaxy.com](http://worksheetgalaxy.com).

**Thank you for downloading!**

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