Science Chapter 4

ORIGINAL STUDENT INSTRUCTION | FIVE LESSONS

Read the lesson first. Complete the separately linked practice workbook, then discuss the advanced extension. Keep student work private.

Grade 3 Science Chapter 4 | Weather, Water and Ecosystems

Original five-lesson student text covering observation, Earth systems, plants, habitats and scientific inquiry. Use with the Grade 3 Science Chapters 1-3. This is not a complete annual textbook. Work safely with adult guidance and record actual observations without fabricating results.

Lesson 1: Weather Measurements and Variables

Teaching: Weather is the condition of the atmosphere over a shorter period; climate describes patterns over a long period. Temperature can be measured with a thermometer, precipitation with a rain gauge and wind with suitable instruments. A fair weather record includes date, time, location and units. A single day’s weather cannot establish climate. Never go outside during dangerous weather to collect observations.

Worked Model

A student records 18 degrees Celsius at 8 a.m. and 21 degrees Celsius at noon. The measured increase is 3 degrees Celsius. That is an observation, not evidence that the sun alone caused the change.

Discuss and Demonstrate

Explain vocabulary in your own words, draw the concept and identify which details are measured, modeled or hypothesized.

Advanced Science

Advanced: explain why city temperatures may differ by time of day and location.

Lesson 2: Water Cycle, Condensation and Runoff

Teaching: Water moves through evaporation, condensation, precipitation, runoff and infiltration. The sun provides energy for evaporation, and gravity pulls rain and runoff downward. Water can change state without becoming a different substance. A diagram is a model: it shows processes but not exactly where every water molecule travels.

Worked Model

On a sealed clear container under safe room conditions, some water vapor may condense on a cool surface. A model should identify evaporating water and condensed drops, while stating that it does not represent an entire watershed.

Discuss and Demonstrate

Explain vocabulary in your own words, draw the concept and identify which details are measured, modeled or hypothesized.

Advanced Science

Advanced: explain why paving land can increase runoff and reduce infiltration.

Lesson 3: Plant Adaptations and Environmental Conditions

Teaching: Plants have structures that help them survive in particular environments. Roots often absorb water and anchor a plant, leaves commonly capture sunlight, and stems provide support and transport. Different plant species have different tolerances. When comparing two plant groups, change one planned condition and keep water, soil and species otherwise alike.

Worked Model

Two identical seedling groups receive different amounts of light but equal water and soil. The independent variable is light exposure; the measured dependent variable might be stem height. A finding from one seedling is weak evidence, and any sample values in an exercise must be clearly labeled hypothetical.

Discuss and Demonstrate

Explain vocabulary in your own words, draw the concept and identify which details are measured, modeled or hypothesized.

Advanced Science

Advanced: explain how seasonal changes could confound a plant-growth comparison.

Lesson 4: Habitats, Food Webs and Biodiversity

Teaching: A habitat provides organisms with suitable resources and conditions. Producers such as green plants capture energy, consumers obtain energy from other organisms and decomposers break down dead organic matter. A food web connects several feeding relationships; arrows ordinarily show the direction of energy transfer from food to eater. Species richness counts kinds of species, not how many individual organisms occur.

Worked Model

A simplified chain is grass -> grasshopper -> frog. Energy passes from grass to grasshopper and then frog. A real food web includes many other organisms; one chain does not predict every population change.

Discuss and Demonstrate

Explain vocabulary in your own words, draw the concept and identify which details are measured, modeled or hypothesized.

Advanced Science

Advanced: distinguish evidence for a relationship from a prediction about population change.

Lesson 5: Independent Investigation, Evidence and Review

Teaching: Scientific work involves an investigable question, a hypothesis, a safe method, measurements, analysis and limits. Changing multiple factors at once makes it difficult to isolate a cause. Repetition can increase confidence but cannot eliminate every source of uncertainty. Never report invented observations as actual findings.

Worked Model

Practice data, invented for calculation only: seedlings measured 4, 5, 6, 7 and 8 cm. The mean is (4+5+6+7+8)/5 = 6 cm, and the range is 8-4 = 4 cm. These numbers are not from a real experiment.

Discuss and Demonstrate

Explain vocabulary in your own words, draw the concept and identify which details are measured, modeled or hypothesized.

Advanced Science

Advanced: explain one source of uncertainty and propose a valid improvement.

Course Reference

Partial reference: Alabama Science Course of Study, grade three. Related areas include weather and climate, organisms and inherited traits, habitat conditions and evidence. Full objective-by-objective standards mapping still requires verification.