Life Science: Biology

Name _____ Date _____

SESSION 1

Which way did carbon move?

In a simplified closed, illuminated chamber, carbon dioxide measured 500, 460 and 420 ppm at 0, 10 and 20 min with a leafy plant. A matching chamber without a plant stayed at 500 ppm. Propose a process, cite two readings and describe where some carbon atoms could end up.

Time (min)	Plant (ppm)	Control (ppm)
0	500	500
10	460	500
20	420	500

Start here if you were away. Identify what changed and what stayed the same in the comparison chamber.

SESSION 2

A model with a missing arrow

A student's ecosystem model has Sun → grass → rabbit → fox and says “all matter and energy cycle back to the Sun.” Correct the model by adding a decomposer and CO_2. Explain how energy and carbon move differently.

Start here if you were away. Trace one carbon atom and one transfer of energy separately.

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SESSION 3

Trace an inherited difference

Assume a single gene with two alleles and complete dominance. Two unaffected parents each carry one recessive allele for a fictional seed trait. For Aa × Aa, represent possible offspring, calculate the chance of aa, and evaluate “exactly one of the next four will be aa.”

Start here if you were away. List A and a as possible contributions from each parent.

SESSION 4

Explain selection with a counterexample

In two fictional insect populations the dark-color trait is inherited. On dark bark, its frequency changes from 20% to 45% to 62% across three generations. On pale bark it stays near 20%. Propose a selection explanation and one observation that would test it.

Start here if you were away. Underline that the measurements span generations.

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SESSION 5

Test a feedback model

In an illustrative mammal, a rise above usual body temperature increases heat loss at the skin. Measurements after exercise are 38.6, 38.0 and 37.4 °C over 20 minutes. Draw a feedback loop, use the data and predict what happens to the heat-loss response near baseline.

Start here if you were away. Write “temperature rises” as the first box.

SESSION 6

Separate association and mechanism

Across matched ponds, pools with more floating plants have average light of 30 units below the surface and submerged plant growth of 2 cm/week. Comparison pools average 70 units and 5 cm/week. Make a mechanistic claim, cite values, and design a comparison to test light as the cause.

Start here if you were away. Circle the two variables measured below the surface.