RLP-BIOB · RLP Biology B — Ecosystems, Evolution and Human Impact

Unit 5: Missouri Biology Supplement

Practice Workbook. The same problems, in the same order, as the Practice sections of the online lessons.

Name _____ Period _____

Lesson 5.1 — Two Ways to Make Offspring, and What Embryos Reveal

FLUENCY

1. Name the type of reproduction: a mayapple colony spreading from underground rhizomes.

2. How many parents contribute genetic information to an offspring in sexual reproduction, and what fraction comes from each?

3. Name two features you can see in early vertebrate embryos that are hard to see in the adults.

APPLICATION

4. Assume (for illustration) that each spring aphid gives birth to 4 daughters per generation, all without mating. How many aphids descend from one founder after 5 generations, and how much genetic variation do they carry?

5. A fruit fly has 4 chromosome pairs. How many chromosome combinations can independent assortment produce in one fly's gametes?

6. In the reading's figures, the corn snake embryo has many more coils than the mouse embryo and no limb buds. What do these differences predict about the adults?

CHALLENGE

7. A disease that kills one strain of strawberry plant arrives in two Missouri patches: one grown from runners of a single plant, one grown from wild seed. Predict the outcome in each and explain using the genetic information offspring receive.

8. A website shows Haeckel's 1874 embryo drawings as proof of common ancestry. Write two sentences evaluating this evidence and saying what better evidence looks like.

REVIEW

9. (Unit 3) Name two other kinds of evidence for common ancestry besides embryos.

10. (Biology A) What process makes gametes with half the chromosome number?

Lesson 5.2 — Life and Earth Change Each Other

FLUENCY

1. List Earth's four systems.

2. About how long ago did oxygen first build up in Earth's atmosphere, and what caused it?

3. What is Missouri's state fossil, and in what kind of rock is it usually found?

APPLICATION

4. MDC estimates about 15 million acres of Missouri prairie before settlement and fewer than 70,000 acres today. What percentage remains?

5. NOAA's 2026 forecast was 7,027 square miles and the measured zone was 1,332 square miles. What percentage of the forecast was measured?

6. Trace the chain from a Missouri cornfield to a fish leaving the Gulf floor, naming each Earth system the nutrients pass through.

CHALLENGE

7. Explain how the rise of atmospheric oxygen is an example of feedback between life and Earth's systems, not just a one-way effect.

8. The 2025 five-year average was 4,755 square miles and the 2035 goal is 1,900. If the average fell by the same number of square miles each year from 2025 to 2035, how much would it need to fall per year?

REVIEW

9. (Unit 1) Why does decomposition of a large algal bloom lower oxygen in water?

10. (Unit 2) Name one way restoring a wetland can increase biodiversity.

Lesson 5.3 — Resources, Hazards and Sustainability in Missouri

FLUENCY

1. Name one natural resource and one natural hazard that have shaped where Missourians live.

2. What is the formula for next year's herd in the lesson's deer model?

3. How many acres of floodplain did the L-536 setback reconnect to the Missouri River?

APPLICATION

4. St. Louis's floodwall is 52 feet and the 1993 crest was 49.58 feet. How much room was left?

5. Run the deer model for one year with h = 0.30 from N = 20,000 (r = 0.4, K = 30,000). Give the growth, harvest and new herd.

6. Continue the model for ten years. What herd sizes do h = 0.10, 0.20 and 0.30 reach in year 10?

CHALLENGE

7. Use N = K(1 – h/r) to find the long-run harvest hN and understory index W for h = 0.15. Compare it with h = 0.20.

8. A critic says the L-536 setback “wasted” 1,040 acres of farmland. Write a two-sentence response that weighs this constraint against the evidence.

REVIEW

9. (Unit 1) In the logistic model, at what herd size is growth rN(1 – N/K) largest when K = 30,000?

10. (5.2) Name one way the L-536 setback could help the Gulf hypoxic zone.

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