

Flow of Energy in an Ecosystem: Comprehensive Question Bank



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف التاسع العام ← علوم ← الفصل الأول ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 2026-09-23 15:33:09

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي | للمدرس

المزيد من مادة
علوم:

إعداد: Adel Rania

التواصل الاجتماعي بحسب الصف التاسع العام



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف التاسع العام والمادة علوم في الفصل الأول

ماكس بلانك في العلوم: مبادئ علم البيئة

1

ملزمة تحتوي على شرح دروس الفصل كامل بالإضافة الى تمارين بعد كل درس منهج انسباير

2

اسئلة درس reactions chemical - أنسباير

3

التفاعلات الكيميائية - بريدج

4

الكائنات الحية وعلاقاتها المتبادلة - عام بريدج

5



Principals of Ecology

Flow of energy in an ecosystem Review



التاريخ

23/9/2026



المعلمة

Rania Adel



الصف

التاسع عام
أنسباير



المادة

science



افهم



اكتشف



استكشف

<https://almanahj.com/ae>



2023



Flow of Energy in an Ecosystem

Comprehensive Question Bank (Grade 9 General)

Module: Biology / Ecology Assessment

Assessment Structure & Progression

Complete all progressive levels. Do not advance to the final Answer Key until all questions have been independently attempted.



LEVEL 1: EASY (Recall & Identification)

Q1. (Multiple Choice): What is the primary role of an autotroph in an ecosystem?

- ☐ A. Consume other living organisms for energy.
- ☐ B. Collect energy from sunlight or inorganic substances to produce food.
- ☐ C. Break down dead matter using digestive enzymes.
- ☐ D. Consume only primary producers.

Q2. (True / False): Heterotrophs that prey on other heterotrophs are scientifically classified as herbivores.

Q3. (Fill in the Blank): A heterotroph that gets its energy requirements by consuming other organisms is also referred to as a _____.



LEVEL 1: EASY (Classification Matching)

Q4. (Matching): Match the heterotroph classification to its correct energy acquisition method based on the ecosystem model.



1. Omnivore

A. Breaks down dead organisms by releasing digestive enzymes.



2. Detritivore

B. Preys exclusively on other heterotrophs.



3. Decomposer

C. Eats fragments of dead matter, returning nutrients to soil, air, and water.



4. Carnivore

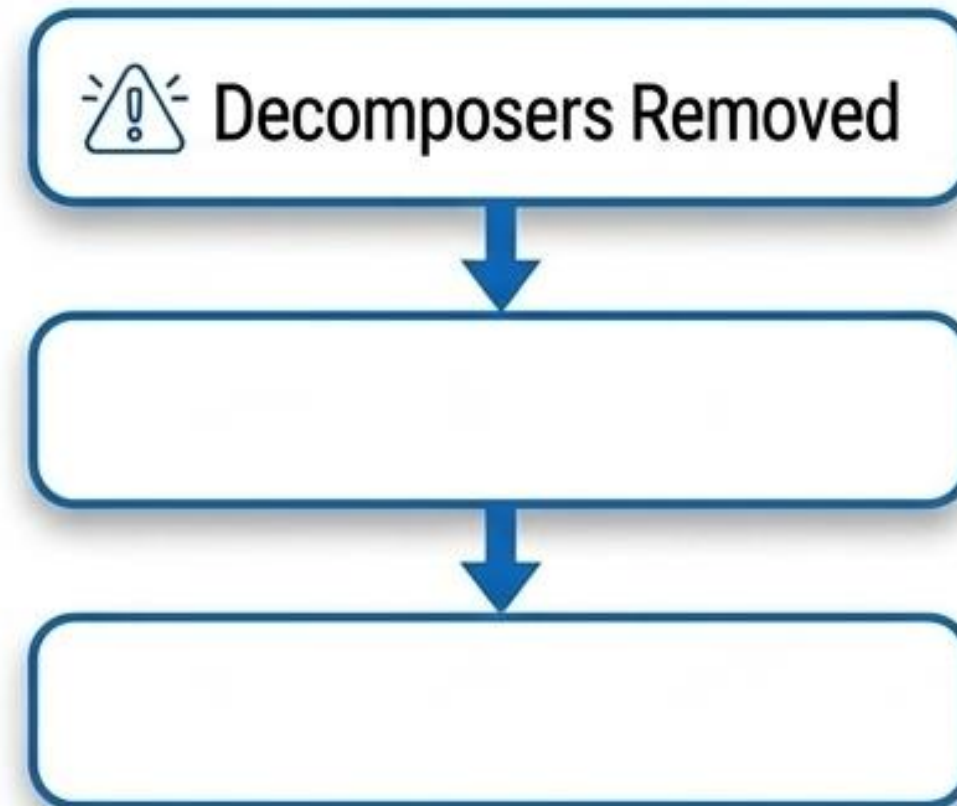
D. Consumes both plants and animals.

LEVEL 2: MEDIUM (Understanding & Relationships)

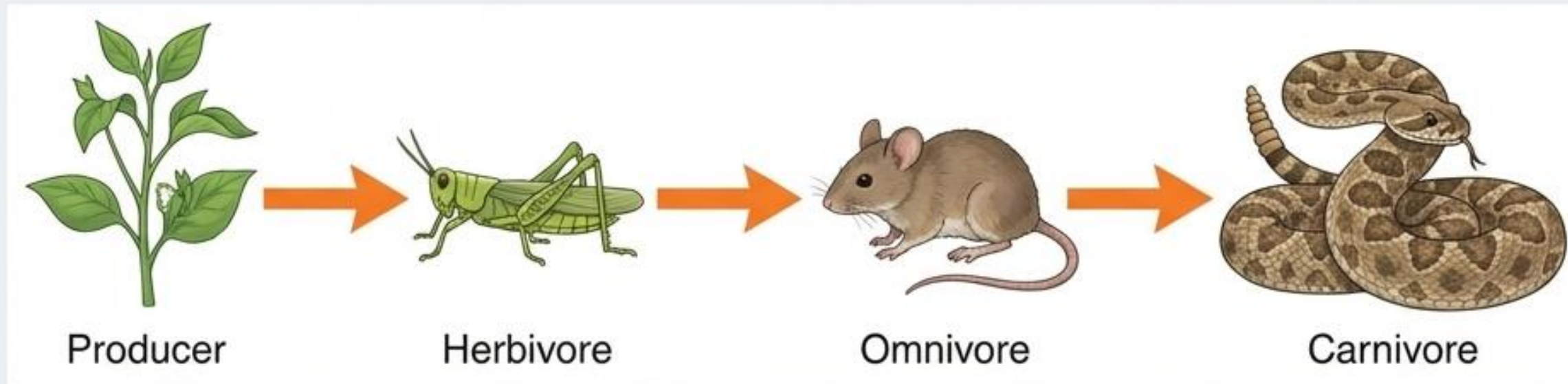
Q5. (Compare & Contrast) Based on your knowledge of nutrient recycling, differentiate between a detritivore and a decomposer. Provide one specific example of a decomposer mentioned in the text.

Detritivore	Decomposer

Q6. (Cause & Effect) What would be the immediate cascading effect on an ecosystem if decomposers were completely removed from the environment? Explain what happens to the organic material.



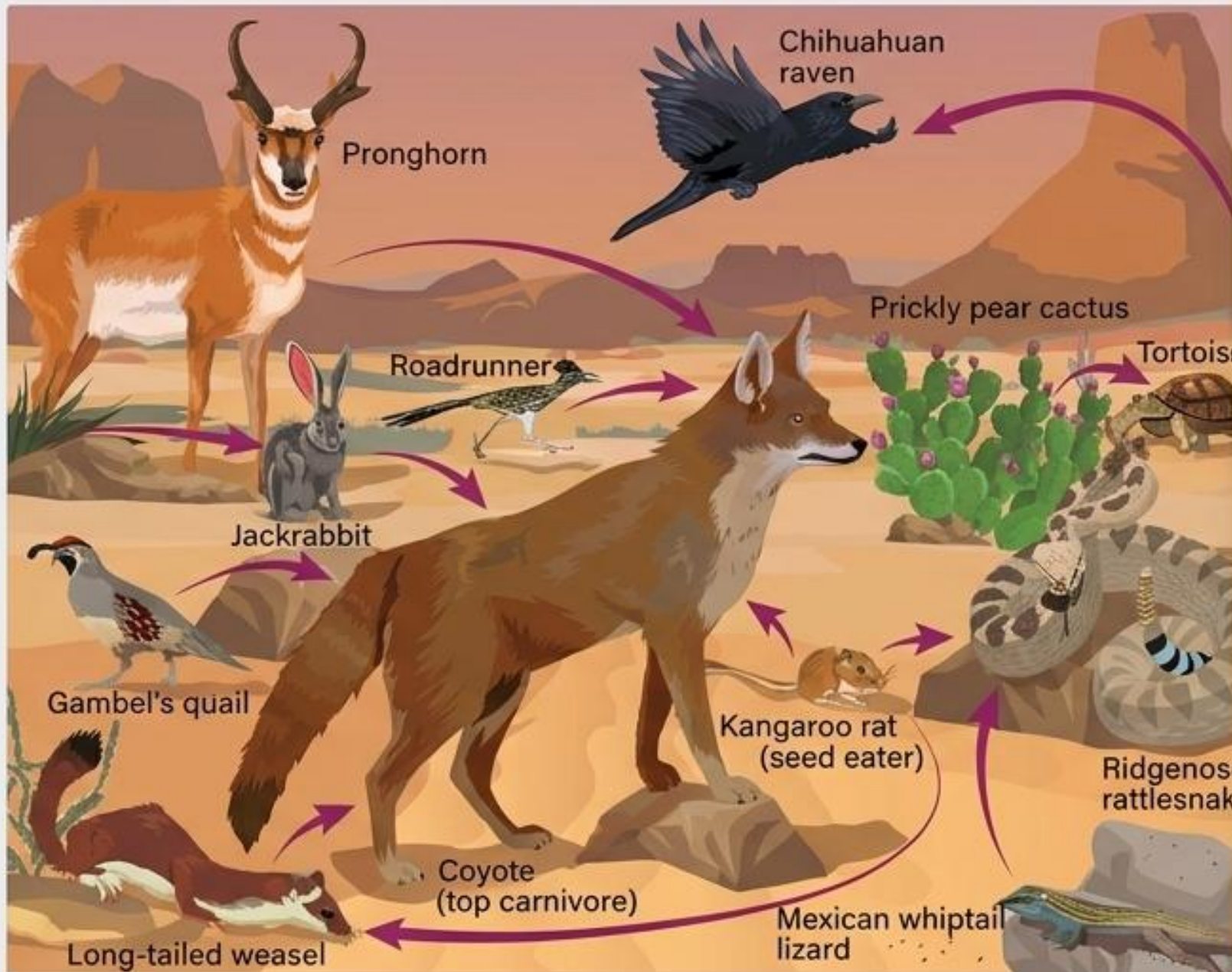
LEVEL 2: MEDIUM (Visual Application)



Q7. (Visual Analysis): Examine the provided model of a simplified grassland food chain.

- A) Identify the specific trophic level occupied by the mouse.
- B) In ecological models, what do the arrows connecting the organisms specifically represent? Name two ways this transferred resource is ultimately used or lost at each step.

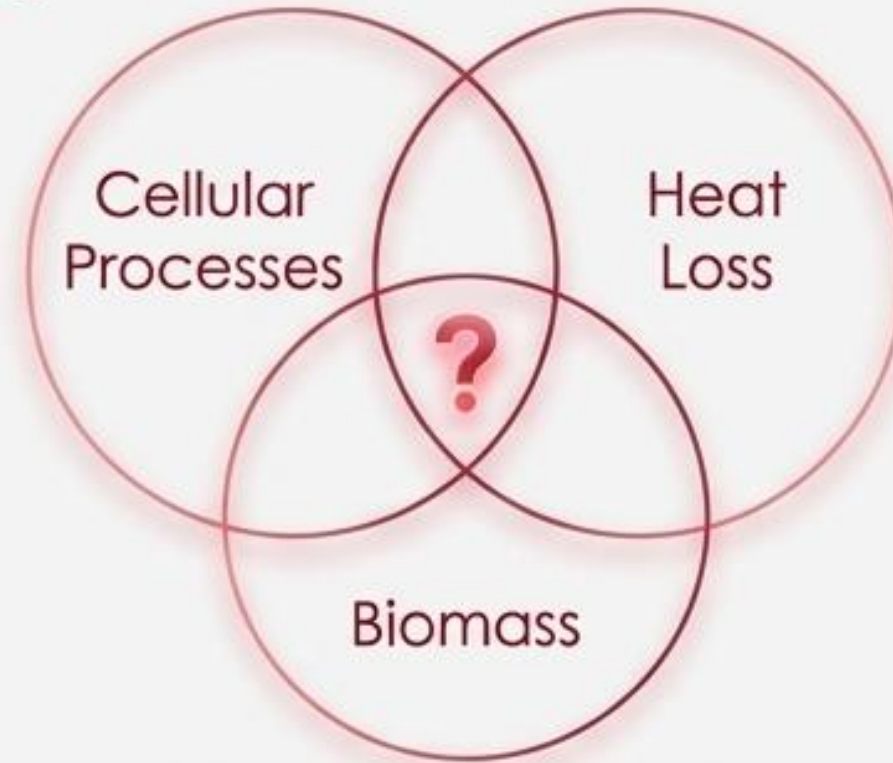
LEVEL 3: HARD (Interpreting Information)



Q10. (Model Evaluation): Analyze the interconnected desert food web provided. Ecologists state that a food web is a more accurate representation of community feeding relationships than a single food chain. Extract specific evidence from this visual model to support this claim (e.g., track the feeding pathways of a specific organism).

LEVEL 4: HOT / CRITICAL THINKING (Synthesis & Evaluation)

SCIENCE ZONE | Prepared by Rania Adel



Q12. (Critical Evaluation): Notice that ecological models showing energy, numbers, and biomass are almost always shaped as pyramids. Synthesize the concepts of 'cellular processes,' 'heat loss,' and 'biomass' to evaluate why these models take a pyramidal shape. Based on this synthesis, explain why an ecosystem typically cannot support an infinite number of trophic levels.

LEVEL 4: HOT / CRITICAL THINKING (Problem Solving)

SCIENCE ZONE | Prepared by Rania Adel



Q13. (Scenario-Based Prediction): You are an ecologist studying an isolated ecosystem. You observe a sudden, massive disease that wipes out 80% of the primary producers' biomass. Predict the long-term cascading effects on the relative numbers of organisms at the third-level consumer tier. Justify your prediction using the core principles of energy flow.



ANSWER KEY - strictly for teacher use / self-grading.

Level 1 Answers

A1: B. Collect energy from sunlight or inorganic substances...

A2: False (They are classified as carnivores).

A3: Consumer.

A4: 1-D (Omnivore), 2-C (Detritivore), 3-A (Decomposer), 4-B (Carnivore).

Level 2 Answers

A5: Detritivores eat fragments of dead matter (e.g., worms).

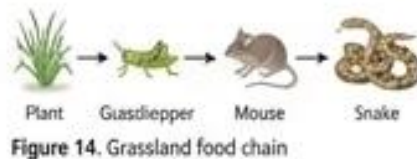
Decomposers break down dead organisms by releasing digestive enzymes (e.g., fungi, bacteria).

Level 2 Answers (Cont.)

A6: Organic material would pile up; essential nutrients would not be returned to the soil/water, starving producers and collapsing the ecosystem.

A7: A) Secondary consumer (or 3rd trophic level).

B) Arrows represent energy flow. Energy is used for cellular processes/building tissue or released as heat.



Level 3 Answers

A8: They use bacteria that convert inorganic substances like hydrogen sulfide and carbon dioxide into organic molecules.

A9: Heterotroph (cannot make its own food).
Omnivore (commercial diets contain both plant and animal matter).

Level 3 Answers (Cont.)

A10: Most organisms feed on more than one species. E.g., in the web, a coyote feeds on badgers, lizards, and rodents, creating interconnected pathways rather than a single linear chain.

A11:

Producers: 1,500,000 units.



Primary Consumers (10%): 150,000 units.



Secondary Consumers (10%): 15,000 units.

Rule: The 10% rule (only 10% of energy is transferred to the level above).

Level 4 (HOT) Answers

A12 (Key Points):

- ✓ Biomass (total mass of living matter) decreases at each level.
- ✓ This happens because ~90% of energy is consumed by cellular processes or lost as heat.
- ✓ Therefore, there is less energy available to support organisms at higher levels, creating a pyramid shape.
- ✓ It limits infinite levels because eventually, the remaining energy is too small to support a viable population of apex predators.

A13 (Key Points):

- ✓ The drastic drop in base energy means a severe reduction in available energy cascading up.
- ✓ Since only 10% transfers at each level, the 3rd-level consumers will face a massive energy deficit, leading to starvation and a sharp decrease in their population numbers (or localized extinction).



Teacher Rania Adel