

Módulo de Evolución.

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El presente documento plantea los lineamientos para realizar y presentar los mapas conceptuales, el video, y examen.

Mapa conceptual

- Se pueden repartir partes del mapa entre cada miembro del equipo, pero todos deben repasar el mapa.
- Los resúmenes se califican con respecto al número de preguntas correctamente respondidas. De ser el caso, el resumen vale 5 participaciones.
- Si el resumen es completo, claro, ordenado, y llamativo podrían obtener 5 participaciones más.

Video

- Cada equipo realizará y subirá en orden una cadena de tres o cuatro videos de 1min c/u a TikTok o Instagram.
- En la cadena de videos deben exponer uno de los ejemplos de evolución adaptativa que se presentan en [esta](#) liga.
- Dos equipos no pueden abordar el mismo ejemplo, de hacerlo se anula la calificación para ambos.
- Deben buscar información relativa al ejemplo que hayan elegido en al menos 5 fuentes confiables distintas (e.g., artículos de periódicos internacionales reconocidos, artículos científicos, artículos de divulgación científica, libros académicos, entrevistas con investigadores).
- En los comentarios de cada video deben escribir las referencias adecuadamente.
- En los comentarios de cada video deben escribir el equipo al que pertenecen.
- No es necesario que mencionen en el video a qué equipo pertenecen, pero sí que pertenecen a la Facultad de Ciencias Biológicas de la Universidad Autónoma del Estado de Morelos.
- En el video pueden salir ustedes con o sin filtros, o poner imágenes.
- Se calificará la claridad, manejo del tema, exactitud de conceptos, confiabilidad de fuentes, y creatividad.
- Se revisará que las referencias coincidan con el contenido, de no ser el caso se anulará la calificación para el equipo.

Examen

- Para repasar pueden regresar a las secciones de los capítulos 22, 23, 24 que veremos en clase.

- Pueden repasar los resúmenes de conceptos clave “Summary of key concepts” de cada capítulo, como el de la figura 1 (abajo).
- Pueden repasar los términos y definiciones de los conceptos encontrados en los documentos y ligas de videos que descargaron (temas, glosario, temario), así como complementar su entendimiento con el contenido de cada capítulo.
- El examen será oral y consistirá de 10–15 preguntas por equipo.
- Las preguntas pueden ser dirigidas a todo el equipo o a un integrante.
- Las preguntas del examen las sacaré de 5 fuentes:
 1. Las definiciones del glosario correspondientes a los conceptos que anote en el temario y que vimos en clase;
 2. Los puntos vistos en clase de los “Test your understanding” de cada capítulo como los de la figura 2;
 3. “concept check” de temas que vimos en clase (figura 3; múltiples por capítulo);
 4. preguntas de figuras vistas en clase como la figura 4;
 5. y preguntas que yo he generado correspondientes a los temas que hemos visto.
- Notas:
 - No preguntaré los “scientific inquiry”, “write about a theme: organization” y “synthesize your knowledge” de la sección “test your understanding”.
 - No pediré que hagan cálculos sobre el equilibrio de Hardy-Weinberg, solo que entiendan sus conceptos asociados; por ejemplo, no preguntaré la pregunta 3 de la figura 3.

22 Chapter Review

Go to **Mastering Biology** for Assignments, the eText, the Study Area, and Dynamic Study Modules.

SUMMARY OF KEY CONCEPTS

To review key terms, go to the **Vocabulary Self-Quiz** in the **Mastering Biology** eText or Study Area, or go to goo.gl/zkz9t.

CONCEPT 22.1

The Darwinian revolution challenged traditional views of a young Earth inhabited by unchanging species (pp. 469–471)

- Darwin proposed that life’s diversity arose over long periods of time from ancestral species through natural selection, a departure from prevailing views. For example, Cuvier studied **fossils** but denied that **evolution** occurs; he proposed that sudden catastrophic events in the past caused species to disappear from an area. Lamarck hypothesized that species evolve, but the underlying mechanisms he proposed are not supported by evidence.

? Why was the age of Earth important for Darwin’s ideas about evolution?

CONCEPT 22.2

Descent with modification by natural selection explains the adaptations of organisms and the unity and diversity of life (pp. 471–476)

- Darwin’s experiences during the voyage of the *Beagle* gave rise to his idea that new species originate from ancestral forms through

the accumulation of **adaptations**. He refined his theory for many years and finally published it in 1859 after learning that Wallace had come to the same idea.

- In *The Origin of Species*, Darwin proposed that over long periods of time, descent with modification produced the rich diversity of life through the mechanism of **natural selection**.

Observations

Individuals in a population vary in their heritable characteristics.

Organisms produce more offspring than the environment can support.

Inferences

Individuals that are well suited to their environment tend to leave more offspring than other individuals.

and

Over time, favorable traits accumulate in the population.

? Describe how overreproduction and heritable variation relate to evolution by natural selection.

Figura 1.

TEST YOUR UNDERSTANDING

➔ For more multiple-choice questions, go to the **Practice Test** in the Mastering Biology eText or Study Area, or go to goo.gl/GruWRg.

Levels 1-2: Remembering/Understanding

- Which of the following is an observation or inference on which natural selection is based?
 - Individuals do not vary in their heritable characteristics.
 - Only well-adapted individuals produce offspring.
 - Species produce more offspring than the environment can support.
 - Nearly all of each individual's offspring will survive and reproduce.
- Which of the following observations helped Darwin shape his concept of descent with modification?
 - Species diversity declines farther from the equator.
 - Fewer species live on islands than on the nearest continents.
 - Birds live on islands located farther from the mainland than the birds' maximum nonstop flight distance.
 - South American temperate plants are more similar to South American tropical plants than to European temperate ones.

Levels 3-4: Applying/Analyzing

- Within six months of effectively using methicillin to treat *S. aureus* infections in a community, all new *S. aureus* infections were caused by a resistant strain (MRSA). How can this best be explained?
 - A patient must have become infected with MRSA from another community.

Levels 5-6: Evaluating/Creating

- EVOLUTION CONNECTION** Explain why anatomical and molecular features often fit a similar nested pattern. In addition, describe a process that can cause this not to be the case.
- SCIENTIFIC INQUIRY • DRAW IT** Mosquitoes resistant to the pesticide DDT first appeared in India in 1959, but now are found throughout the world. (a) Graph the data in the table below. (b) After examining the graph, hypothesize why the percentage of mosquitoes resistant to DDT rose rapidly. (c) Suggest an explanation for the global spread of DDT resistance.

Month	0	8	12
Mosquitoes Resistant* to DDT	4%	45%	77%

*Mosquitoes were considered resistant if they were not killed within 1 hour of receiving a dose of 4% DDT.

Data from C. F. Curtis et al., Selection for and against insecticide resistance and possible methods of inhibiting the evolution of resistance in mosquitoes, *Ecological Entomology* 3:273–287 (1978).

- WRITE ABOUT A THEME: INTERACTIONS** Write a short essay (about 100–150 words) evaluating whether changes to an organism's physical environment are likely to result in evolutionary change. Use an example to support your reasoning.
- SYNTHESIZE YOUR KNOWLEDGE**



This honey pot ant (genus *Myrmecocystus*) can store liquid food inside its expandable abdomen. Consider other ants you are familiar with, and explain how a honey pot ant exemplifies three key features of life: adaptation, unity, and

Figure 2.

CONCEPT CHECK 23.3

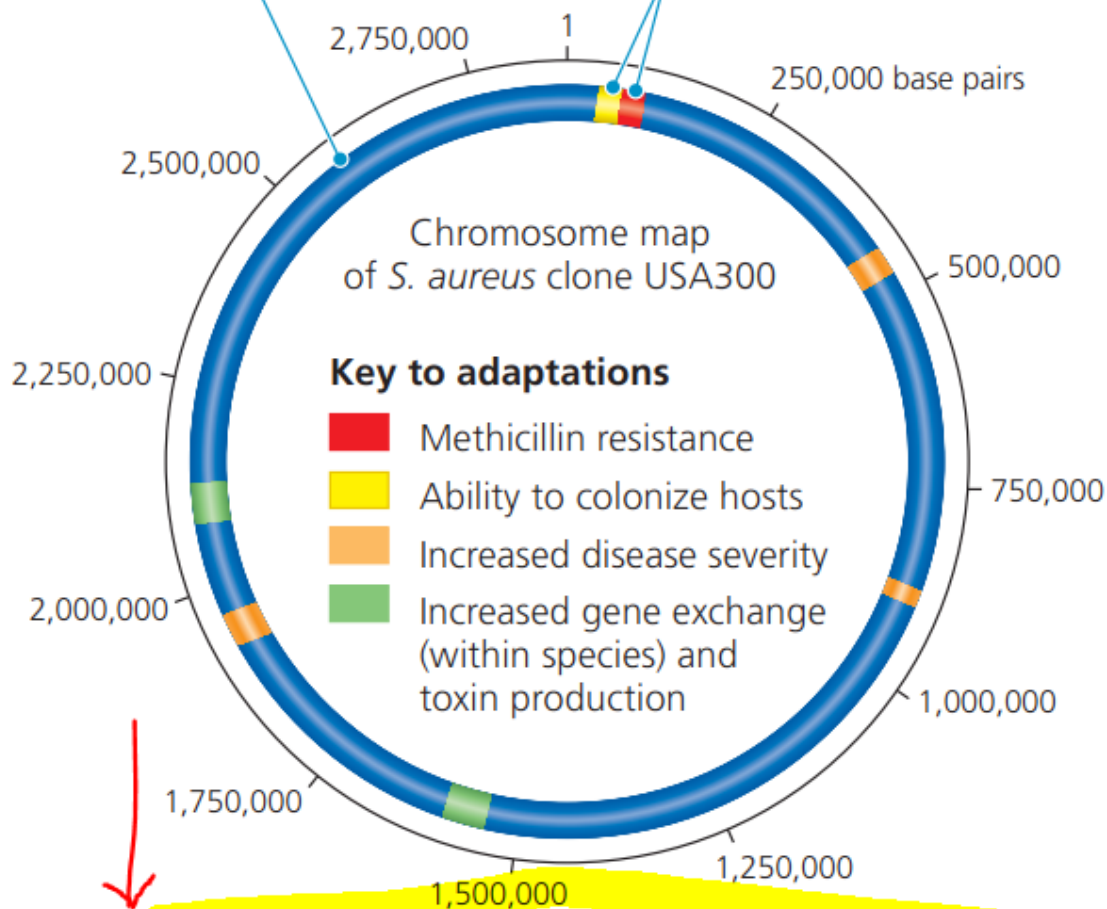
- In what sense is natural selection more “predictable” than genetic drift?
- Distinguish genetic drift from gene flow in terms of (a) how they occur and (b) their implications for future genetic variation in a population.
- WHAT IF?** Suppose two plant populations exchange pollen and seeds. In one population, individuals of genotype *AA* are most common (9,000 *AA*, 900 *Aa*, 100 *aa*), while the opposite is true in the other population (100 *AA*, 900 *Aa*, 9,000 *aa*). If neither allele has a selective advantage, what will happen over time to the allele and genotype frequencies of these populations?

Figure 3.

▼ **Figure 22.14 Clone USA300: a virulent strain of methicillin-resistant *Staphylococcus aureus* (MRSA).** Resistant to multiple antibiotics and highly contagious, this strain and its close relatives can cause lethal infections of the skin, lungs, and blood. As shown here, researchers have identified key areas of the USA300 genome that code for adaptations that cause its virulent properties.

The circular chromosome of clone USA300 has been sequenced and contains 2,872,769 base pairs of DNA.

Regions highlighted in colors other than blue contain genes that increase the strain's virulence (see the key).



WHAT IF? Some drugs being developed specifically target and kill only *S. aureus*; others slow the growth of MRSA but do not kill it. Based on how natural selection works and on the fact that bacterial species can exchange genes, explain why each of these strategies might be effective.

Figura 4.