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| Form | BA - 2, Science, Grade 8, SY 24-25 |
| Identifier | F-BO07WQ_C37245 |

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| Item | BA-2_Science_Grade 8_01 |
| Identifier | I-SCI-F-S000026_C06014 |
| Standards | SCI.6-8.MS-LS4-1 |

A paleontologist is comparing images of three different fish species which are shown in the images.



Cambrian fish
~ 500 million Years Ago



Armored fish head *Dunkleosteus*
~ 400 million years ago



Xiphactinus
~ 100 million years ago

Using your understanding of change over time and the above images of each fish, which statement correctly summarizes the changes in fish over the past several hundred million years?

- A Fish as a species have become more diverse in the number of different species that appear in the fossil record.
- B Fish as a species have become less diverse in the number of different species that appear in the fossil record.
- C Fish as a species have developed more complex anatomical structures as they move toward the modern-day era.
- D Fish as a species have developed more simplistic anatomical structures as they move toward the modern-day era.

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| Item | BA-2_Science_Grade 8_02 |
| Identifier | I-SCI-F-S000026_C24960 |
| Standards | SCI.6-8.MS-LS4-1 |

What can the fossil record tell us about the history of life on Earth?

- A The exact lifespan of each species.
- B Patterns of existence, diversity, extinction, and change in life forms.
- C The daily habits of ancient organisms.
- D The current population of endangered species as compared to 100 years ago.

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| Item | BA-2_Science_Grade 8_03 |
| Identifier | I-SCI-F-S000026_C45680 |
| Standards | SCI.6-8.MS-LS4-1 |

What assumption do scientists make when analyzing patterns in the fossil record?

- A Natural laws operate today exactly as they did in the past.
- B All species have remained unchanged throughout history.
- C The Earth's climate has always been the same.
- D Only marine life forms can be fossilized.

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| Item | BA-2_Science_Grade 8_04 |
| Identifier | I-SCI-F-S000026_C20111 |
| Standards | SCI.6-8.MS-LS4-2 |

A student is at a science museum and sees an exhibit that shows the skulls of a wild dog, wolf, coyote, and gray fox. They are all carnivores that hunt prey for meat, but wolves eat larger animals, whereas coyotes and foxes eat smaller animals.



Based on the anatomical similarities and differences, what can the student conclude about these three species?

- A The variation in anatomical features is the result of different diets.
- B Variations in anatomical features are a result of natural selection.
- C Temperature changes in their environment led to variations in anatomical features.
- D Selective pressure from human controlled breeding programs allowed for variations in anatomical features.

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| Item | BA-2_Science_Grade 8_05 |
| Identifier | I-SCI-F-S000026_C45993 |
| Standards | SCI.6-8.MS-LS4-2 |

Anatomical Similarities and Differences in Bird Species

| Bird Species | Wingspan (cm) | Beak Length (mm) | Feet Color |
|--------------|---------------|------------------|------------|
| Blue Jay | 30 | 20 | Black |
| Hummingbird | 15 | 5 | Pink |
| Bald Eagle | 200 | 50 | Yellow |
| Penguin | 50 | 10 | Orange |

What can be inferred about the evolutionary relationship between the Hummingbird and the Bald Eagle based on their beak lengths?

- A They are closely related because they have similar beak lengths.
- B They have similar wingspans, suggesting they are closely related.
- C They have similar feet color, indicating a close evolutionary relationship
- D They have different feeding habits, suggesting they are not closely related.

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| Item | BA-2_Science_Grade 8_06 |
| Identifier | I-SCI-F-S000026_C00864 |
| Standards | SCI.6-8.MS-LS4-2 |

Anatomical Similarities and Differences in Bird Species

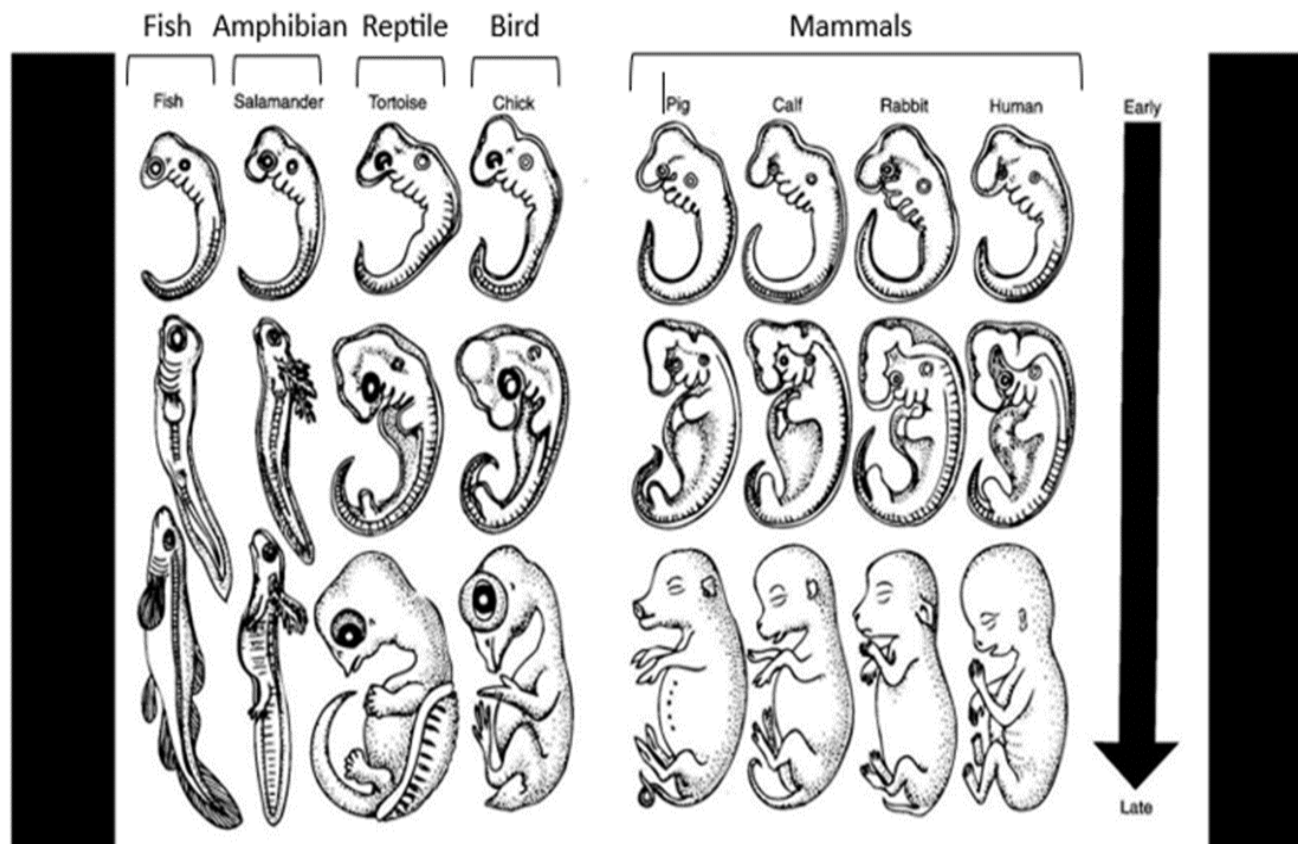
| Bird Species | Wingspan (cm) | Beak Length (mm) | Feet Color |
|--------------|---------------|------------------|------------|
| Blue Jay | 30 | 20 | Black |
| Hummingbird | 15 | 5 | Pink |
| Bald Eagle | 200 | 50 | Yellow |
| Penguin | 50 | 10 | Orange |

How can scientists use the anatomical differences in feet color among the bird species to infer evolutionary relationships?

- A Feet color directly indicates how closely related the two species are.
- B Feet color indicates which birds can fly and which cannot.
- C Feet color alone cannot determine evolutionary relationships but can provide clues when combined with other anatomical data.
- D Feet color is the most reliable indicator of evolutionary relationships among birds.

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| Item | BA-2_Science_Grade 8_07 |
| Identifier | I-SCI-F-S000026_C10101 |
| Standards | SCI.6-8.MS-LS4-3 |

Comparative Embryological Development

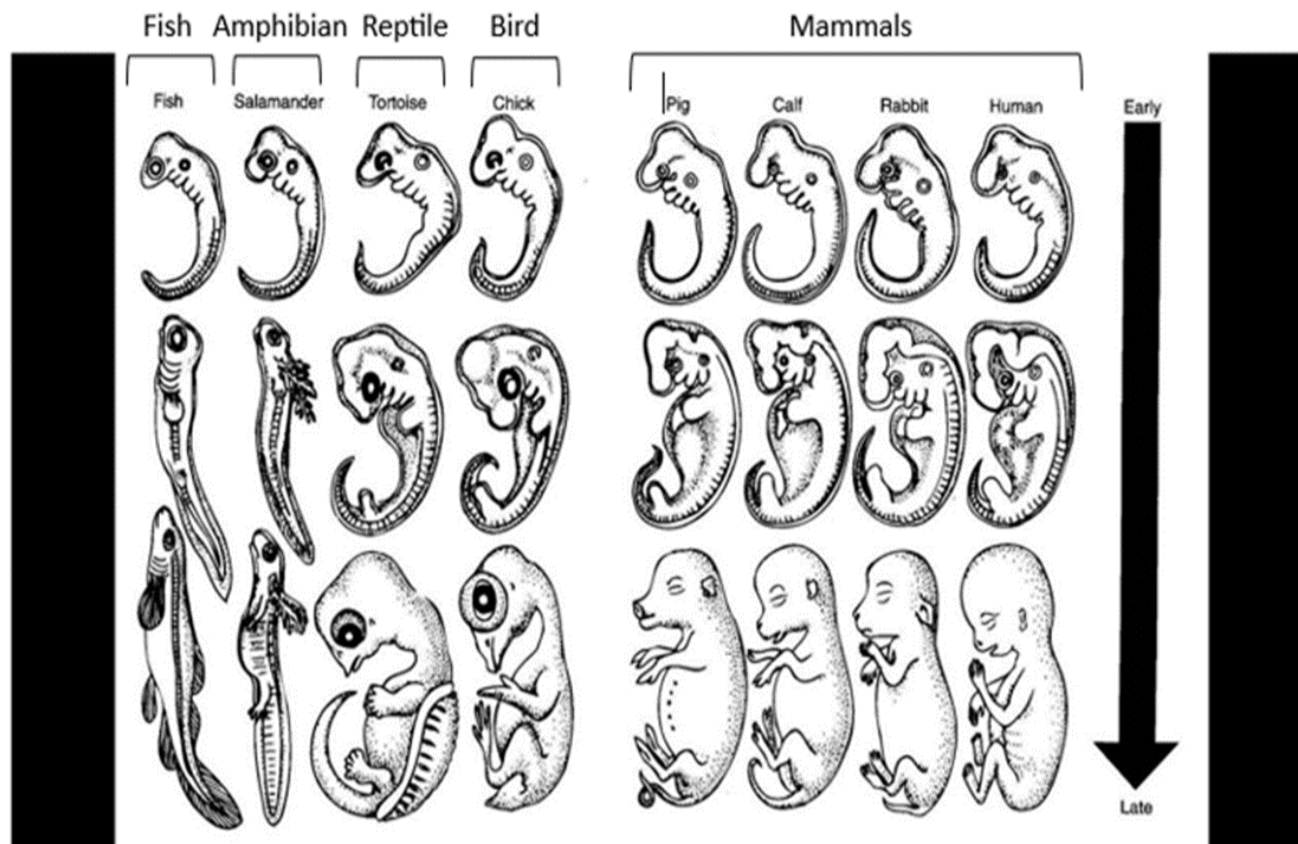


Based on embryological development, which statement is true about the comparison between bird and mammal embryos?

- A Bird embryos have more features in common with reptile embryos than mammal embryos.
- B Mammal embryos and bird embryos are identical in all stages of development.
- C Bird embryos and mammal embryos have no common features.
- D Bird embryos develop fur-like structures like mammals.

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| Item | BA-2_Science_Grade 8_08 |
| Identifier | I-SCI-F-S000026_C02184 |
| Standards | SCI.6-8.MS-LS4-3 |

Comparative Embryological Development

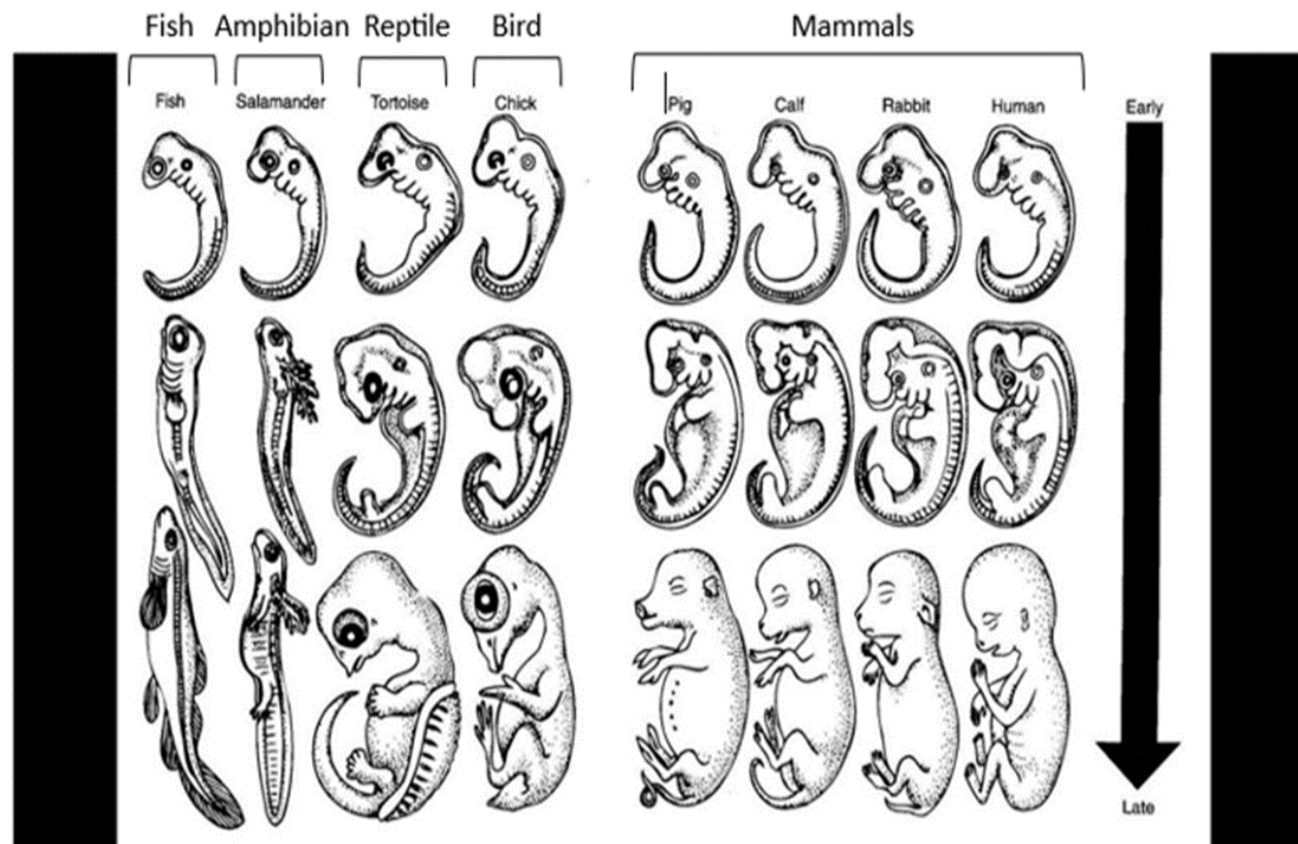


What conclusion can be drawn about the relationship between a fish embryo and a mammal embryo at an early stage of development?

- A They have no similarities.
- B They have identical anatomical structures.
- C They are completely different species with no common traits.
- D They share some similar features, suggesting a common ancestry.

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| Item | BA-2_Science_Grade 8_09 |
| Identifier | I-SCI-F-S000026_C68543 |
| Standards | SCI.6-8.MS-LS4-3 |

Comparative Embryological Development



If two embryos share many similar features in the early stages of development but have different features in the later stages, what does this suggest about their evolutionary relationship?

- A They are not related.
- B They are closely related and share a common ancestor.
- C They evolved in similar environments but are not closely related.
- D Their development patterns are coincidental and do not indicate any relationship.

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| Item | BA-2_Science_Grade 8_10 |
| Identifier | I-SCI-F-S000026_C16751 |
| Standards | SCI.6-8.MS-PS1-4 |

Your teacher asks your class to develop a model that shows the particles that make up a solid stick of butter before and after thermal energy is transferred into the system. You and your classmates arrange themselves so that they are standing on the floor in a 4 X 4 grid, everyone holding the hand of the person next to them, to represent the solid stick of butter. The image below represents that grid.

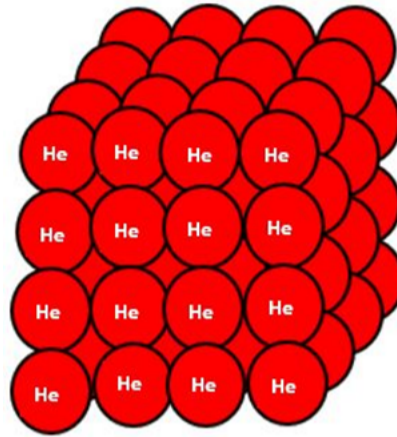


What claim could you make when the students let go of each other's hands and move away from one another?

- A Magnetic field energy has been added to the system causing the particles to repel each other.
- B Potential energy was added to the stick of butter forcing the particles apart.
- C Thermal energy was added to the system causing the particles to increase in kinetic energy and move apart.
- D Thermal energy was removed from the system which resulted in particles no longer being bound together.

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| Item | BA-2_Science_Grade 8_11 |
| Identifier | I-SCI-F-S000026_C31602 |
| Standards | SCI.6-8.MS-PS1-4 |

Brittany is observing a model of helium, in which the molecules are being held under extreme pressure. The model is shown below.



How would the model change if the pressure were reduced and thermal energy was added to the system?

- A Increasing thermal energy would cause the molecules to vibrate more and possibly separate.
- B The thermal energy would be absorbed by the helium molecule and the sample would get colder.
- C The helium would ignite as thermal energy is added to this system would cause complete combustion.
- D The thermal energy would be converted to potential energy causing the helium to become denser.

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| Item | BA-2_Science_Grade 8_12 |
| Identifier | I-SCI-F-S000026_C20542 |
| Standards | SCI.6-8.MS-PS1-4 |

Which of the following best describes what happens to water when energy is removed?

- A The water molecules move faster and spread apart.
- B The water molecules move slower and come closer together.
- C The water molecules stop moving completely.
- D The water molecules move at a constant speed.