

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

1. A frog can lay thousands of eggs at once, while elephants give birth to only one baby at a time. Discuss the benefits and disadvantages of these reproductive methods for different species.
2. Discuss the meaning of the comment, "Death for an individual animal can mean life for a whole host of other living things."
3. Is it true that all animals resemble their parents? Explain.

Follow-up Activities

- Divide students into groups. Assign each group a different animal species to study and have them illustrate the different stages of their life cycles and what features characterize each stage.
- Have students create a new species of animal accompanied by illustrations and text describing the life cycle of the animal, along with its appearance and that of its parents.
- Have students research the life span of many animals. Integrate this into a math lesson by creating line or bar graphs summarizing this data.
- Have students write two brief stories about what life is like from the point of view of a 130-year-old tortoise and a one-hour-old mayfly.

Internet Resources

Periodically, Internet Resources are updated on our web site at www.LibraryVideo.com

- www.enchantedlearning.com/subjects/butterfly/lifecycle/index.shtml

This Web site explains the metamorphosis of a butterfly, featuring descriptions of each stage in the life cycle of particular butterflies in addition to information about their life spans. A butterfly life cycle printout is available for use in the classroom.

- www.colapublib.org/children/kids/wild/animal/babies/index.html

Students can test their animal knowledge by matching animal parents with their offspring.

- insected.arizona.edu/uli.htm

This Web site contains many lesson plans and other resources for teaching young children about the life cycles of insects.

Suggested Print Resources

- Anderson, Hans Christian. *The Ugly Duckling*. This classic beautifully illustrates the changes made by a swan as it develops into an adult.
- Hare, Tony. *Animal Life Cycles: Growing Up in the Wild*. Facts on File, New York, NY; 2002.
- Hickman, Pamela. *A New Frog: My First Look at the Life Cycle of an Amphibian*. Kids Can Press, New York, NY; 1999.
- Kalman, Bobbie. *Life Cycle of a Bird*. Heineman Press, Chicago, IL; 2002.

TEACHER'S GUIDE CONSULTANT

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All About Animal Life Cycles

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create a "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the followup questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



Program Summary

All animals — from the heavy hippo to the cuddly koala — have a life cycle that involves many changes from beginning as an egg in a shell or a womb through development into an adult. This process is best described if visualized as a circle, where a baby is born, grows, becomes an adult and eventually has babies of its own, completing the cycle through reproduction. This life cycle is different for different animals and often depends on an animal's basic needs and the environment in which it lives. Some animals are fed and taught how to survive by their parents, while other animals rely on their natural instincts from the moment they are born.

From birth to adulthood, animals go through different stages of development. Animals generally resemble their parents; however, in the case of animals that experience metamorphosis, like most insects and amphibians, they look very different during the first three stages of their lives. The stages of metamorphosis are the egg, larva, pupa and adult stages.

At some point, an animal stops reproducing, begins to grow old and eventually dies. An animal's life span is the amount of time it is alive, and this can vary tremendously between animals. The average life span of a human is 75 years, while the average life span of the grey fly is around one week. But even in death, there are ways an animal helps the life cycles of others to continue. The animal can be used as food or it can decompose, providing the soil with nutrients. With that in mind, it becomes apparent that the life cycles of animals are part of a much larger cycle, a cycle that includes all living things.

Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

life cycle — A series of stages all living things go through that includes being born, developing into adulthood and eventually reproducing.

organism — Any living thing, plant or animal.

caterpillar — The larval stage of a butterfly.

tadpole — The swimming, larval stage of a frog before it undergoes metamorphosis into an adult.

reproduction — The process of producing a new generation of offspring.

offspring — Baby animals.

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egg — The reproductive cell that is the first stage in the life cycle of almost all animals; an egg contains everything needed for developing a new animal after it is fertilized. Some animals lay eggs that develop outside the mother's body; other animals, like humans, develop from eggs inside the mother's body. Bird eggs have hard shells; fish and frog eggs have a soft covering and must remain in water to develop.

egg case — A leathery shell containing a yolk sac and embryo; some animals, like the shark, develop in egg cases.

fertilization — The process in which the egg cell from the mother is combined with the sperm cell of the father, creating one new cell, which develops into an organism inheriting its parents' characteristics.

sperm cell — The reproductive cell of the father which combines with the mother's egg cell in fertilization.

zoologist — A scientist who studies animal life.

life span — The amount of time that an animal lives (e.g. humans have an average life span of 75 years).

instinct — A built-in pattern of behavior with which an animal is born.

metamorphosis — Extreme physical changes during different stages of some animals' life cycles. The four stages that animals like butterflies experience are: egg stage, larva stage, pupa stage and adult stage.

egg stage — The first stage of an animal's life; after fertilization, the single egg cell splits in two and those cells divide as the animal begins to grow within the egg.

larva stage — The immature, wingless and often wormlike stage that insects and some other animals enter after hatching from an egg.

pupa stage — The intermediate stage of an insect when it is covered by a cocoon and transforms into an adult.

adult stage — The last stage of an animal's life cycle when it is fully mature and capable of reproduction.

decompose — The breaking down of plants and animals when they die; the nutrients in their bodies are then used by other plants and animals.

Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. How do animals change as they grow?
2. What kinds of animals develop from eggs?
3. What changes will you go through in your life as you grow up?
4. How long do animals live?

(Continued)

After the class has completed their "Everything We Know About..." list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. What is a life cycle?
2. What is meant by the term "reproduction?"
3. What is the difference between a fertilized egg and an unfertilized egg?
4. What kinds of animals develop from eggs?
5. What are the basic needs that animals must meet in order to live out their full life span?
6. What kinds of animals take care of their babies?
7. What kinds of animals don't take care of their babies?
8. What is instinct? Identify some examples of instinctive behavior.
9. Do humans have instincts?
10. Why doesn't a baby frog (a tadpole) look like its parents?
11. What is a metamorphosis?
12. What are the four stages in a butterfly's metamorphosis?
13. At what stage in the life of a butterfly does it look like its parents?
14. At what stage in the life of an elephant does it look like its parents?
15. How long do animals live?
16. What is the average human life span? Does that mean that all humans will live the same number of years?
17. What does it mean to decompose? When does that happen?

Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised before viewing the program. *(Continued)*