

The Passion of Animals

Curricular Materials Prepared by
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Index:

- *Journey of the Universe Book*: Chapter 7: The Passion of Animals.
- *Journey of the Universe Film*: Scene 7: Learning and Senses; Scene 8: Death and Passion.
- *Journey of the Universe Conversations*: Disc 2 – Program 7: The Passion of Animals.

Scientific Summary:

Passion, desire, parental care, and sexual choice are integral parts of the ongoing evolution of life. Animals exhibit and act upon a wide variety of courtship behaviors ranging from the dance of stickleback fish to the spider's rhythmic plucking of the strings of its web. The process that Darwin called "sexual selection" is a complex one in which animals – and sometimes even plants – make reproductive choices by choosing partners and acting out courtship rituals.

Parental care, especially in species with a longer maturation period such as reptiles and mammals, is a term that ethnologists use to describe the acts of nourishing, protecting, and teaching that parents provide for their progeny. In mammals, females will often spend more time caring for their young than will males both in the actual pregnancy and after giving birth. This means that female mammals are often more selective in choosing their partners than males since they will invest significantly more time, energy, and matter in their offspring. The same can be said for many reptiles, some of which will incubate their eggs or protect their young from predators after they hatch. Paleontologists have even found fossil evidence that suggests dinosaurs were caring for their young as far back as one hundred million years ago.

Reproduction, expressing passion, and caring for the next generation of offspring are activities that are woven into the very fabric of life. Trees devote massive amounts of time and energy to producing seeds, some fish remain near their fry to ward off predators, and each and every organism cares for, and attempts to pass on, the genetic material found in its DNA.

Discussion Questions:

1. What kinds of creative and dynamic tensions do you see present in the process of reproduction and evolution? What comparisons and analogies can you make connecting reproduction in mammals to other non-biological evolutionary processes such as the formation of elements in stars or the emergence of galaxies?

2. Recall a particular image or quote from the *Journey of the Universe* film or *Conversations* that brings the passion of animals to life for you. What is it about this particular image or quote that captures your imagination? What insights, questions, or feelings does that particular scene or quote invoke?
3. In the *Conversations*, paleontologist Scott Sampson talks about the coevolution of flowers and dinosaurs. How does thinking about passion, reproduction, and caring for offspring as a process that is coevolutionary or cooperative change the way that you understand it?
4. How can you apply what you have learned here in other parts of your professional or personal life? How will a particular lesson or concept in this portion of the *Journey of the Universe* project change the way that you think or act?

Online Resources:

- For more information on evolution and the adaptation of life, go to the [National Academy of Science's Evolution Resources](#) website. Their [section for educators](#) offers an extensive list of educational resources such as links to articles, journals, websites, and more.
- The Berkeley University website entitled [Understanding Evolution](#) has a wide array of useful links and resources for educators. Teachers interested in issues related to evolution might find the [Evolution 101](#) and the [Teaching Materials](#) sections of their website to be particularly helpful.
- Go to the Yale Forum on Religion and Ecology's website for a [comprehensive list](#) of links to scientific organizations and educational resources. Highlights from this extensive list include: [NASA's Earth Science](#) website, the [National Science Foundation](#) website, the [Union of Concerned Scientists](#), the [Ecological Society of America](#) website, and the [National Oceanic and Atmospheric Administration](#) website.
- Visit the [National Science Foundation's website](#) for an exploration of Darwin's *The Origin of Species* and the ways in which his ideas have changed and been studied over time.
- Visit the [American Museum of Natural History's website](#) for a wide variety of useful links.
- For information on biodiversity and species preservation, visit the World Wildlife Fund's (WWF) [biodiversity](#) page and the [United Nations Environment Programme \(UNEP\) World Conservation Monitoring Centre \(WCMC\)](#).
- The TED series can be an excellent source of information from top scientists. [This talk by evolutionary biologist, E.O. Wilson](#), for example, brings a deep knowledge of life's diversity into conversation with religion.
- The [Journal of Evolutionary Biology](#) and [Evolution](#) are two of the many peer-reviewed journals that publish academic articles and scientific studies on evolutionary biology. [Nature](#), an international journal of science, is another useful online resource.
- National Public Radio can be an accessible and unique way to access information on dinosaurs, reproduction, evolution, and parental care. Whether you are looking

for information on [“dinosaur dads”](#) or the [relationship between mating and nest decorations in birds](#), NPR has a wide variety of articles, photos, and of course, interviews and discussions.

Print Resources:

- [Journey of the Universe Bibliography](#).
- [Science Bibliography from the Yale Forum on Religion and Ecology](#).

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