

**10. Ph. ARTHROPODA ("jointed foot"), Subph. Crustacea ("crusted")**

"Don't accept the chauvinistic tradition that labels our era the age of the mammals.  
This is the age of the arthropods." --S.J. Gould

MAJOR TAXA

Ph. Arthropoda (1-5,000,000 species???)

*Subph. Trilobita (extinct)*

**Subph. Crustacea (45,000 species)**

**Cl. Malacostraca**

**O. Decapoda (shrimp, lobster, crab)**

**O. Isopoda, O. Amphipoda**

**Cl. Maxillopoda**

**Subcl. Copepoda (copepods)**

**Subcl. Ostracoda (bivalved ostracods)**

**Subcl. Branchiopoda (*Daphnia*)**

**Subcl. Cirrepedia (barnacles)**

Subph. Chelicerata (spiders, scorpions, etc.)

Subph. Tracheata (hexapods and myriapods)

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Recap: Molluscan body plan and diversity among classes: shells, mantle cavity and respiration, mechanisms of locomotion and feeding, habitats, methods of defense

**TOP TEN areas to explore and appreciate about arthropods**

10. Hardening of the cuticle to form an **exoskeleton**
9. Ranges of movement and dexterity through **jointed appendages**
8. Distribution and use of **muscles** for locomotion
7. Diversification of body regions through **tagmatization**
6. Growing larger inside a skeleton: **molting** and patterns of periodic growth
5. Methods of internal circulation with a **tubular heart** and **ostia**
4. Function of the **open circulatory system**
3. No cilia: **muscular ventilation** of respiratory structures
2. **Crustacea**: diversification of limbs and tagmata
1. Evolutionary relationships with other phyla and within the arthropods

**GOALS**

After studying from lecture notes and the associated reading, you should be able to:

- Describe similarities and major differences between annelids and arthropods
- Explain the construction of the arthropod exoskeleton, including how its material properties vary on different parts of the body, how layered sections are arranged, and how it is used to antagonize particular muscles
- Explain how the distribution and use of muscles for locomotion by arthropods is radically different from the annelids and molluscs
- Explain in detail how arthropods solve the problem of growing larger while enclosed in a hard structure, how this solution differs from that in molluscs, and why arthropods appear to grow only periodically
- Describe the importance of arthropod internal body cavities (coelom and hemocoel), and explain how blood circulation differs from that in annelids
- Describe gill ventilation and explain how this differs from molluscs and annelids
- Describe the generalized crustacean, including the number of segments, the distribution of appendages, and the grouping of segments into tagmata
- Describe how appendages and tagmata vary within the class Malacostraca and among other classes, and describe multiple possible uses to which jointed appendages have been adapted