Outline	Reference	Activity	Optional
Theme: Invertebrates			
Topic 06. Introduction; arthropods			
• **Introduction**	**Outline 06**		
• **Learning objectives**			
Distribution of didgeridoos	**Movie 06010 Termites and didgeridoos**		
• **Associated with flora**			
• **Associated with termites**			
Termites			**Optional https://www.wettropics.gov.au/site/user-assets/docs/64Termites.pdf**
• **Ecological niche**	**Fact sheet 06010 (Tropical topics): 1 (The good guys)**		
• **Ecological importance of termites**			
Insect body structure	**Page 744; Section: General Characteristics of Arthropods & Section: Insects**		
• **Exoskeleton**			
Basic insect body plan			
Tagmatization			
Head			
• Feeding apparatus			
Sensory apparatus			
• Brain			
Thorax			
• Legs			
• Wings			
Abdomen			
• Gut			
• Reproductive	**Page 972; Figure 42.3a**		
• Circulation	**Fact sheet 06010 (Tropical topics): 2 (The colonial life)**		
Termites			
Social complexity		**Worksheet 06010 (Social organization of termites)**	
Castes			
• Highly specialized roles			
Division of labour			
Colony operates as a superorganism	**Movie 06020 (Repairing the mound)**		
• The roles of the castes are reflected in their body forms			
• Repairing the mound	**Page 1191; Section: Pheromones**		
Communication			Trapping alien crayfish with pheromones (http://news.bbc.co.uk/2/hi/science/nature/2414881.stm)
• Pheromones	**Fact sheet 06010 (Tropical topics): 3-4 (Nests and mounds; Citadels and invaders)**	**Worksheet 06020 (Pheromones)**	
Ecological importance		**Worksheet 06030 (Ecological importance of termites)**	
Niche specialization	**Fact sheet 06010 (Tropical topics): 5 (Squatters)**		
Mounds	**Fact sheet 06010 (Tropical topics): 3 (Food preferences)**		
Types			
• Dependent on species and conditions			
• Mounds as refuges			
Digestion of wood	**Page 962; Section: Mutualistic Adaptations in Herbivores**		
• Food sources	**Fact sheet 06020 (Feeding and evolution)**		
• Herbivory			
Adaptation			
Initially			
Short gut			
• Like cockroach			

▼ Mutualism • Bacteria • Flagellates ▼ Evolutionary advancement ▼ Digestion • Mutualistic organisms ▼ Enzymes in some • Longer gut • Chambers • Fungus gardening			
▼ **Classification of termites** • Taxonomic ranks	**Page 580; Section: Hierarchical Classification & Page 585; Section: Cladistics Page 580; Figure 26.3 Page A-51; Appendix B: Classification of Life**	**Worksheet 06040 Hierarchy of classification**	
▼ The families of termites • Identification of termites		**Worksheet 06050 (Families of termites)**	
▼ **Invertebrates** ▼ **Termites are examples of invertebrates**	**Page 711; CONCEPT 32.1 Animals are multicellular, heterotrophic eukaryotes with tissues that develop from embryonic layers**	**Worksheet 06040 (Hierarchy of classification)**	
▼ Structural • No backbone (= invertebrate) • **Characteristics of arthropods**	**Page 744; Sections: Arthropods -Arthropod Origins & General Characteristics of Arthropods**	**Worksheet 06060 (Characteristics of the Arthropoda). Complete for termite.**	
▼ **Termites are insects** ▼ Insects ▼ Very successful on land • Locomotion • Sensory • Organizational	**Movie 06040 (Green ants and IPM)**		
▼ **Green ants** ▼ **Movie** • IPM • Nests • Social organization • Territoriality • Food • Communication	**Fact sheet 06030 (Green ants - CSIRO)** Movie 06050 (Green ant alate)		
▼ **Fact sheet - Green ants** • Structure of ant ▼ **Classification of ants**			**Optional: Electron micrographs of Australian ant subfamilies (http://www.ento.csiro.au/science/ants/subfamily_list.htm); Fact sheet 06040 (Key to common subfamilies of Australian ants); the online version (http://www.ento.csiro.au/science/ants/key/subfamily_key.htm)**
• Place in Arthropoda • Sub-groups of ants		Worksheet 06060 (Characteristics of the Arthropoda). Complete for green ant.	
▼ **Insects** ▼ **Co-evolution with angiosperms** ▼ Mutual benefit • Pollen dispersal for plants			

- Food for insects
  - Ecological niches
- **Mouth parts**
- **Flight**
  - Energy
    - Food
    - Oxygen
      - Tracheal system
        - Spiracles

Movie 01020 (Energy expenditure and feeding)

Page 988; Section: Tracheal Systems in Insects
Fig. 42.23

Page A-51; Appendix B: Classification of Life

Other arthropods

- **Classification of arthropods**
- **Insecta**

Movie 06120 (Spider)
Page 744; Section: Chelicerates
Movie 06080 (Ornate lobster)
Movie 06100 (Cherabin)
Movie 06090 (Barnacle)
Page 744; Figure 33.38

Worksheet 06060 (Characteristics of the Arthropoda).

- **Arachnida**
- **Crustacea**

Page 744; Section: Myriapods
Movie 06130 (Centipede)

Other movies at: http://www.seaotter.com/marine/html/movies.html

- **Diplopoda and Chilopoda**