





Rise of hard-shelled, and skeletal organisms: Trilobite fossils









Table 11.1 Organisms as Producers and Consumers			
Туре	Energy Source	Carbon Source	Example
Photoautotroph	Sun	co,	Cyanobacteria
Photoheterotroph	Sun	Organic compounds	Purple bacteria
Chemoautotroph	Chemicals	CO2	H, S, Fe bacteria
Chemoheterotroph	Chemicals	Organic compounds	Most bacteria, fungi, and animals, including human
Table 11-1 Understanding Earth, Fifth Edition © 2007 W.H. Freeman and Company Consum	ers = heter	otrophs; feed on	producers



Iron respiring bacteria on iron oxide mineral (hematite Fe₃O₄)



Yellowstone hot springs: Extremophile bacteria



Mid-ocean ridge hydrothermal "black smoker" system injects sulfur into seawater



Tube worms at mid-ocean ridge: contain sulfur-metabolizing bacteria











Apex chert, NW Australia; 3.4-3.5 b.y. old oldest photosynthetic bacteria fossils?











Banded iron formations

"Rusting of Earth"

due to rise of atmospheric oxygen created by photosynthesis























Enter the Cambrian hard-shelled fossils

Explosive radiation of animals

Paleozoic Era "Early Life"

begins in oceans, ends on land





Silurian



















the world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."

