



MACRO MONITORING

KC Water offers water quality education to students of all ages. All lessons can be modified for various grade-levels to meet science standards and are free of charge to schools, residents, and businesses in Kansas City. Schedule a lesson at water.education@kcmo.org.



OVERVIEW: Students are introduced to benthic macroinvertebrates and how they are used to determine water quality. Students learn about the general characteristics of macros, their importance and role in the food chain, and descriptions of a healthy macro habitat. Connections are made as to how stormwater runoff negatively impacts these habitats. Students become familiar with the physical characteristics to identify macros and their level of pollution tolerance. Finally, students study and identify macros found in local waterways. KC Water provides all necessary equipment and supplies for this activity.

TOTAL CLASS TIME: Approximately 1 hour. This lesson is best conducted at a water site, but can also be completed in the classroom.

KEY COMPONENTS: Introduction includes the characteristics macroinvertebrates and healthy habitats. Main story includes physical characteristics of macros and their habitats. Conclusion engages students in identifying macros and assigning points to assess water quality. In addition to NGSS/MLS, this lesson also relates to standards for Language Arts and Mathematics.

KEY VOCABULARY: Benthic, macro, invertebrates, habitats, exoskeleton, larva, nymph, pupa, metamorphosis, pollution sensitive



Water Quality
EDUCATION

Macro Monitoring

NEXT GENERATION SCIENCE STANDARDS / MISSOURI LEARNING STANDARDS

PHYSICAL SCIENCE		Grade 5	Grade 6-8	Grade 9-12
PS2-Motion & Stability: Forces & Interactions	B-Types of Interaction	5.PS2.B.1		
EARTH and SPACE SCIENCE		Grade 5	Grade 6-8	Grade 9-12
ESS3 - Earth and Human Activity	A- Natural Resources			9-12.ESS3.A.1
	C- Human Impacts on Earth's Systems	5.ESS3.C.1		
			6-8.ESS3.C.2	9-12.ESS3.C.2
LIFE SCIENCE		Grade 5	Grade 6-8	Grade 9-12
LS1 - From Molecules to Organisms: Structure and Processes	B- Growth and Development of Organisms		6-8.LS1.B.1	
			6-8.LS1.B.2	
LS2-Ecosystems: Interactions, Energy, & Dynamics	A- Interdependent Relationships in Ecosystems		6-8.LS2.A.1	9-12.LS2.A.1
			6-8.LS2.A.2	HS-LS2-7
	C-Ecosystem Dynamics, Functioning and Resilience			9-12.LS2.C.1
			6-8.LS2.C.2	9-12.LS2.C.2
				HS-LS2-7
LS4 - Biological Evolution: Unity and Diversity	C- Adaption			9-12.LS4.C.2
				9-12.LS4.C.3
ENGINEERING TECHNOLOGY and the APPLICATION OF SCIENCE		Grade 5	Grade 6-8	Grade 9-12
ETS1 - Engineering Design	A- Defining and Delimiting Engineering Problems		6-8.ETS1.A.1	
			6-8.ETS1.B.1	
	B- Developing Possible Solutions		6-8.ETS1.B.2	