EDUCATION ABOUT THE ENVIRONMENT

Program Development

Topic: Age-Appropriate programs

Best Practice: Effective programs are designed to match the developmental stages of the learner.

Children learn in completely different ways than adults, and to be effective, children's environmental education programs should be designed to match children's developmental needs, interests, abilities, and learning styles. Too often, children's programs are developed from an adult's perspective, rather than from a child's perspective.

Programs and instruction should be different for different age groups to match their cognitive development, attention spans, coordination abilities, inter ests, and ways that they interact with nature. A good rule of thumb: "One size does not fit all; one program does not fit all ages!"

Another oft-made mistake is teaching children too abstractly. Children do not begin to develop the ability for abstract reasoning until age nine. In fact, the transition from concrete to abstract thought can continue throughout a person's life, with 68% of us never completely attaining this stage of formal reasoning. Similarly, studying about the loss of rainforests and endangered species may be perfectly appropriate starting in middle school, but younger students are not developmentally ready for dealing with these problems. In fact, when we present these environmental problems to children who are too young to understand, we may be facilitating feelings of anxiousness, helplessness, and potential fear of the natural world and ecological problems.

Additional Resources and Information

Excellence in Environmental Education – Guidelines for Learning (Pre K-12) (North American Association for Environmental Education, www.naaee.org) offers a framework for skill levels and knowledge appropriate for three grade levels -- fourth, eighth, and twelfth grades. In *Beyond Ecophobia: Reclaiming the Heart in Nature Education* (Orion Society's Nature Literacy Series, 1999), David Sobel claims that "If we want children to flourish, we need to give them time to connect with nature and love the Earth before we ask them to save it." The book provides great suggestions and examples of age-appropriate activities.

References:

National Resource Council. 1996. National Science Education Standards. National Academy Press.

Epstein, H.T. The Fourth R or Why Johnny Can't Reason. http://www.brainstages.net/index.html.

Theory of Cognitive Development. 2006. Wikipedia.

1996. Principles of child development and learning that inform developmentally appropriate practice. National Association for the Education of Young Children.

2006. Sharing Science with Children: A Survival Guide for Scientists and Engineers. North Carolina Museum of Life and Science, Durham, NC.

Suggestions and Guidelines for Working with Children

Grade	Characteristics	Effective Techniques/Methods	Techniques/Methods That Should Be Avoided	Appropriate Topics	Topics to Avoid
K-2	o Play is important, especially creative, dramatic o Active constructors of knowledge o Learning is result of interactive processes o Concrete thinkers: believe only what can see o Has difficulty controlling impulses, regulating behavior	o Develop a sense of connectedness and empathy for the natural world by *becoming* things – hop like a rabbit, slither like a snake, roar like a mountain lion o Active constructors of knowledge o Use manipulatives (large size) o Engage all senses o Activities that last 5-10 minutes.	o Allow children to *become* things before objectifying them – e.g., fly like a bird before identifying different kinds of birds o Should not sit still or listen passively for more than 5-10 minutes.	o Life Cycles o Colors, patterns o Locomotion o General characteristics – plants, animals and objects can be sorted by these characteristics o Animal senses	o Tragedies: big, complex problems beyond the scope of the child's world – endangered species, habitat destruction, natural disasters. o Ecology (ecological cycles are too extended in time and space)
3-5	o Begin transition to abstract thinking: begins to understand concepts as well as objects o Begin to formulate hypotheses and use systematic problem-solving strategies o Works well in social groups and independently o Likes to memorize and learn facts	o Exploration o Develop sense of place through direct experiences in nature; immersion in the landscape. o Free play o Cooperative learning groups o Active constructors of knowledge o Use manipulatives o Engage all senses o Evaluate different perspectives and move away from dichotomous thinking (good vs. bad) through role plays. o Activities that last 15-30 minutes.	o Should not sit still or listen passively for more than 15 minutes. o Abstract concepts that cannot be related to the child's life – e.g., timelines. o Negative experiences in nature– because many naturalists trace their "environmental" roots to special places they connected to at this age.	o Predator-prey and other connections, interrelationships – interactions between organisms and their habitats o Habitats, ecosystems o Adaptations o Food webs o Behavior o Classification o Mapping, orienteering o Water cycle	o No tragedies before fourth grade. o Timelines and other abstract concepts.

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Grade	Characteristics	Effective Techniques/Methods	Techniques/Methods That Should Be Avoided	Appropriate Topics	Topics to Avoid
6-8	o Continue transition to abstract thinking o Able to hypothesize, propose solutions, and evaluate o Developing an understanding of ethical principles o Self-conscious; concerned how he/she is perceived by others o Socially responsible; primed to play a role in the health of nature and society o Able to understand metaphor and complex issues o In a period characterized by "Storm and Stress"	o Service-learning opportunities o Activities that use physical energy and foster higher-level thinking and problem-solving skills. o Activities that are student-driven and experiential. The instructor can begin by engaging the learner and sharing key information. Then the learner should engage in an activity that allows the learner to apply knowledge and answer questions. o Cooperative learning groups o Allow students to create their own predictions, pose hypotheses, and/or design their own investigations. o Allow students to use research to investigate environmental issues. o Activities that last 20-40 minutes	o Should not sit still or listen passively for more than 20 minutes. o Too much lecture. o Singling out individuals and making him or her feel different from others. o Talking "down" to this group – they need to feel adult-like.	o Ecological relationships – interactions between organisms and their habitats o Habitats, ecosystems o Adaptations o Heredity and genetics o Regulation and behavior o Populations and ecosystems o How organisms change through time o Energy o Earth's history, geology, weather and climate o Mapping, orienteering o Human impacts o Characteristics of our solar system	o Avoid framing environmental issues in dichotomies: e.g., jobs vs. owls. Rather, foster critical thinking by in-depth exploration of issues. Students should be given the freedom to formulate and evaluate their own personal views of issues.

Suggestions and Guidelines for Working with Children

Grade	Characteristics	Effective Techniques/Methods	Techniques/Methods That Should Be Avoided	Appropriate Topics	Topics to Avoid
9-12	o Continue transition to abstract thinking o Able to hypothesize, propose solutions, and evaluate o Able to understand metaphor and complex issues o Self-conscious; concerned how he/she is perceived by others o Socially responsible; primed to play a role in the health of nature and society o Concern for what the future holds for them personally o Group-oriented; peer groups shape individual behaviors and actions o Time constraints such as sports, social commitments, and work	o Cooperative learning groups o Discussion methods o Usie analogies that reflect student interest o Involve students in planning the direction of their learning. o Experiential activities that are more self-directed o Allow students to create their own predictions, pose hypotheses, and/or design their own investigations. o Allow students to use research to investigate environmental issues. o Activities that last 20-40 minutes	o Should not sit still or listen passively for more than 20 minutes. o Too much lecture. o Singling out individuals and making him or her feel different from others. o Talking "down" to this group – they need to feel adult-like.	o Ecological relationships – interactions between organisms and their habitats o Habitats, ecosystems o Biodiversity o Heredity and genetics o Regulation and behavior o Populations and ecosystems o How organisms change through time o Energy o Earth's history, geology, weather and climate o Mapping, orienteering o Humans as part of the environment o Influence of weather and climate o Origins and evolution of the universe	o Avoid framing environmental issues in dichotomies: e.g., jobs vs. owls. Rather, foster critical thinking by in-depth exploration of issues. Students should be given the freedom to formulate and evaluate their own personal views of issues.