



Palm Beach County Envirothon Information Guide

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This program is offered to high school students on a nondiscriminatory basis without regard to race, color, national origin, religion, gender, or disability.

What is the ENVIROTHON?

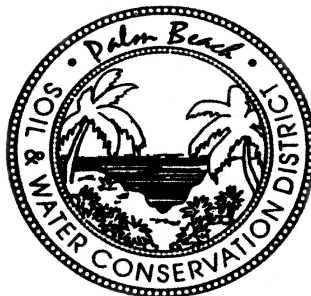
The **Envirothon** is a problem-solving, natural resource education program for high school students. It is a field oriented program where students, working in teams of five, learn to use critical thinking skills and develop problem-solving and communication skills to solve written and oral questions and conduct hands-on investigations about environmental issues. Teams study packets of information and are tested in six natural resource categories: AQUATICS, FORESTRY, SOILS, WILDLIFE, CURRENT ENVIRONMENTAL ISSUE (this changes each year) and ESTUARIES TO EVERGLADES, our local natural resources: Lake Worth Lagoon and the Florida Everglades. These interrelated and broad study areas teach a comprehensive approach to natural resource conservation and can easily be incorporated into a teaching curriculum.

The **Envirothon** is designed to stimulate, reinforce and enhance students' interest in the environment and our natural resources. The concept was created in 1979 by the Pennsylvania Association of Conservation Districts as an outdoor, hands-on educational competition for students who are concerned about the conservation of natural resources and the environment. As of 2011, 45 states and seven Canadian Provinces have initiated the program and compete in the National Canon Envirothon. The first Envirothon competition in Florida was held in Palm Beach County in 1992.

The **Envirothon** stimulates practical curriculum development by establishing broad study areas and by helping schools find useful resources in their community. A partnership between schools, resource agencies and other environmentally concerned organizations is encouraged and promoted. The **Envirothon** encourages a constantly changing curriculum and helps to build strong ties between schools and organizations that help them teach a practical, interdisciplinary brand of environmental education and awareness.

The Palm Beach Soil and Water Conservation District (PBSWCD), in conjunction with cooperating agencies, educators and community groups, conducts the **Palm Beach County Envirothon** early each year. The winning team from this regional competition will then compete in the **Florida Envirothon**. The winning team from the state competition will represent Florida at the National **Canon Envirothon**.

**For More Information on how *you* can become involved with
The Palm Beach County Envirothon, visit the Palm Beach Soil & Water Conservation
District's website at www.pbswcd.org**



PALM BEACH COUNTY ENVIROTHON GOALS

- Cultivate a desire among high school students to learn about Florida's natural environment through a competitive event.
- Develop a greater understanding among high school students of Florida's dependence on the natural environment.
- Promote critical thinking, cooperative problem solving, and decision-making skills.
- Apply techniques learned and developed in a classroom setting to "real world" environmental problems and situations.
- Encourage the cooperation of community groups, educators, government and non-government agencies to create a hands-on, environmental education experience for high school students.

STRUCTURE OF THE PALM BEACH COUNTY ENVIROTHON

Intent to Compete and Registration

Information packets announcing the next regional Envirothon and registration deadlines are sent to all public and private high schools in Palm Beach County annually. It is then up to the teachers, who choose to be Envirothon Team Advisors, to make the information available to students and to help the students organize teams. A simple INTENT TO COMPETE form starts the process and helps us plan for the number of students interested.

Team registration follows, usually in October. Teams shall be comprised of 5 students, plus 1 alternate. Teams will need to designate a team captain and submit a team name. For more information and to download the registration form, please visit www.pbswcd.org.

Preparation

Study -- Each team that registers for the regional Envirothon will receive a resource packet containing information that covers each of the Envirothon topics (aquatics, wildlife, soils, forestry, etc.) Teams may choose to divide their packet among team members for studying purposes. However, it is beneficial if each of the team members has at least reviewed all of the information. The key to studying for and competing in an Envirothon competition is teamwork.

Day of the Event

On the day of the PBC Envirothon, each team is assigned to a rotation group made up of several teams from different schools. Then, as rotation groups travel to different stations, the teams in that group participate in the assigned activity.

Testing Stations -- There are 6 testing stations at the regional Envirothon, each of which represents a different topic. The test, given to each team at a station, contains hands-on, problem-solving oral and objective questions that relate to the topic at that station. Testing stations are staffed by the resource specialists who prepare the test questions and assemble the resource materials.

Knowledge and understanding of the resource materials in the packets are necessary. More important for a successful Envirothon, however, is teamwork, critical thinking, cooperative problem-solving skills and oral presentation.

Review -- After each rotation group has visited every station, teams and their advisors have an opportunity to review the tests and answer keys. The resource specialists who have written the test questions are also available at this time to answer questions.

Awards -- To culminate the event, there is an awards ceremony. Awards are presented for the following categories: Four Year Student Participation, Top Three Teams Overall, and Highest Score for Topic Categories.

After the Event

The first place team from the regional competition will proceed to the Florida Envirothon. The team that places first at the state competition goes on to compete at the National Canon Envirothon. For more information, check out the State and National websites at:

www.flenvirothon.com

www.envirothon.org

WHO MAKES THE EVENT POSSIBLE?

Host Facility - The Envirothon is an interactive, hands-on environmental challenge. For this reason, the questions asked at the event depend largely on the testing topic. Cooperation from the staff at the host facility is important both before and during the event to ensure that everything is set up and running smoothly on the day of the event.

Resource Committee Members - The Palm Beach County Envirothon Resource Committee consists of resource professionals from various local public, private and governmental entities that deal with environmental issues. In addition, an education specialist is available to assist with question writing. The members of this committee may supplement the Florida Envirothon study materials for the study packets that are distributed to each participating team. Members compose the station questions based on the study packet materials for an environmentally challenging event. These committee members are present on the day of the Envirothon to administer the tests at each station.

Sponsors – The PBC Envirothon depends on financial and in-kind assistance from devoted sponsors. Funding is needed for items ranging from T-shirts and the production of resource packets to lunches and prizes on the day of the event. Past sponsors have included: Whole Foods, United Technologies/Pratt & Whitney, Sugar Cane Growers Cooperative of Florida, Florida Power & Light, Publix, Seaworld, Florida Association of Environmental Professionals, and South Florida Water Management District.

Volunteers - Volunteers perform jobs such as station set-up, registration, rotation escort, lunch server, scorekeeper and test runner. People who are interested in volunteering can contact the Palm Beach Soil & Water Conservation District office.

Advisors - An Envirothon team is not complete without an advisor. This person (usually a teacher at the school that the team is representing) plays many roles for their team or teams including the following:

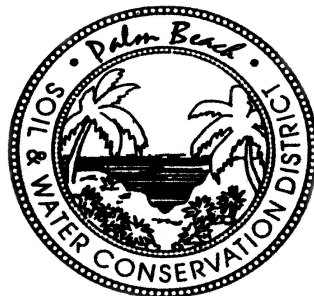
- They act as a liaison between the team and the Palm Beach Soil & Water Conservation District staff.
- They remind the team of deadlines.
- They help the team organize and facilitate study sessions.

An active advisor plays a key role for an active and successful team!

REGIONAL ENVIROTHON RULES & REGULATIONS

1. Palm Beach County students in grades 9 through 12 are eligible to compete.
2. Each participating team will consist of five team members and is allowed one alternate team member, all from the same school. Alternate team members are allowed to attend only as a replacement for an official member.
3. More than one team may enter from each school. Due to space limitations, no more than five teams may enter from any one school, on a first come, first served basis. If multiple programs from one school exist, PBSWCD has the right to consider exceptions on a case by case basis, as space & logistics allow.
4. Each competing team must be accompanied by an adult team advisor. A team advisor may supervise more than one team from the same school.
5. There is a registration fee per student (except alternates). The fee helps to defray the cost of lunch and T-shirts for the students.
6. **All participating students must return a signed Liability Waiver to the PBSWCD office prior to the competition. Students who have not submitted this form are not eligible to compete.**
7. Advisors shall not assist any team(s) during the competition. Advisors may participate in separate activities, but will be available during the competition in case of emergency.
8. Team advisors shall be responsible for the proper conduct of their team members during the Envirothon and at the host facility.
9. The event will have six (6) testing stations. Team work is a valuable component at each station and is a factor of their scores. All students should participate in activities at all stations.
10. Each participating team member must wear the name tag and the Envirothon T-shirt provided by the Palm Beach Soil and Water Conservation District. No school identification will be permitted. Jackets or rain gear may be worn over the T-shirts if necessary.
11. Late arriving teams will be placed at the next starting rotation or other appropriate starting point rather than be inserted into the middle of a location or test section. No provisions will be made for teams to make up missed test section.
12. At the discretion of the coordinators, late arriving teams may be ineligible to be overall winners of the competition.
13. Tobacco, alcohol and drugs are not permitted at the competition site or during any part of the Envirothon. All rules of the host facility will apply.

14. Lunch and beverages will be provided by the Palm Beach County Envirothon. Any participants with special dietary needs or allergies must bring alternative food with them. Participants will not be allowed to leave the premises at any time during the event.
15. Transportation and meals in route will be the responsibility of each participating team.
16. Teams must bring a clip board and a pencil with them to the testing stations. All other materials needed at the testing sites will be provided by the Palm Beach County Envirothon.
17. During the testing periods, teams must remain at their testing station. No movement to other areas is permitted.
18. No conversation with advisors or other teams is permitted during testing periods.
19. **Students will not be permitted to carry anything with them to the testing stations except water, clipboard and pencils unless otherwise specified prior to the competition. No bookbags, purses, backpacks, notes, ipods, mobile phones, head phones, calculators or other electronic devices are allowed during rotations! Any team using these items will be disqualified immediately.**
20. The test format will consist of multiple choice, matching, fill in the blank and oral questions. Teams and advisors will have an opportunity to review tests and answer keys during a designated period after all testing is completed. Neither teams nor advisors will have access to tests or answer keys after that period.
21. Each station has approximately 30 questions. Pre-selected questions serve as tie-breakers.
22. Winning teams will be determined by the highest total number of points.
23. Ties for 1st place overall will be broken by answering a set of questions that will be handed to both teams. The first team that turns in the questions with the most correct answers within one minute will prevail. The other team will fall into 2nd place.
24. Trophies or plaques and medallions will be awarded to the top three teams overall. The top team in each category, excluding the top team overall, will receive a plaque.
25. Rules of the Palm Beach County Envirothon are subject to change without notice.
26. Any violation of these rules and regulations is subject to review by Envirothon Coordinators and may lead to disqualification of a team or teams.



ENVIROTHON AND THE SUNSHINE STATE STANDARDS

The Palm Beach County Envirothon meets many of the Sunshine State Standards in each of the subject areas. The following list gives examples of some of these standards and how they are met.

Language Arts

Standard 1 and 2 are needed when studying the resource packets in preparation for the competition. Students must be able to understand and determine the main idea from a variety of types of written materials including brochures and scientific articles. They must then synthesize the information in order to apply it to real life situations.

1. The student uses the reading process effectively.
2. The student constructs meaning from a wide range of texts.

Standards 3, 4 and 5 are necessary for teams to interpret materials at the testing stations and answer oral questions:

3. The student uses effective viewing strategies.
4. The student uses speaking strategies effectively.
5. The student understands the power of language.

Mathematics

Students must possess the following skills to complete many of the questions on the Envirothon test. They are provided with information in the form of tables, charts, equations and/or maps and they are to use this information to answer questions dealing with real world issues such as the direction and rate of ground water movement. They also must know how to use common field tools and equipment such as a soil survey, a topographic map, a compass or a Biltmore stick to answer some of the questions.

1. The student understands the different ways numbers are represented and used in the real world.
2. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.
3. The student uses estimation in problem solving and computation.
4. The student measures quantities in the real world and uses the measures to solve problems.
5. The student estimates measurements in real world problem situations.
6. The student selects and uses appropriate units and instruments for measurements to achieve the degree of precision and accuracy required in real world situations.
7. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.
8. The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.
9. The student understands and uses tools of data analysis for managing information.
10. The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.
11. The student uses statistical methods to make inferences and valid arguments about real-world situations.

Science

The Envirothon is an educational competition based on environmental science. Therefore, many of the Sunshine State Standards in the category of science comply with the knowledge and skills needed by students to compete in the Envirothon.

1. The student recognizes that energy may be changed in form with varying efficiency.
2. The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.
3. The student understands the need for the protection of the natural systems on Earth.
4. The student describes patterns of structure and function of living things.
5. The student understands the process and importance of genetic diversity.
6. The student understands the competitive, interdependent, cyclic nature of living things in the environment.
7. The student understands the consequences of using limited natural resources.
8. The student uses the scientific processes and habits of mind to solve problems.
9. The student understands that most natural events occur in comprehensible, consistent patterns.

Social Studies

Humans throughout time have relied on the Earth's natural resources for survival. Unfortunately, this reliance can sometimes have negative impacts on the environment. The Envirothon requires students to understand how and what human actions create the environmental conditions that we see today. They also need to understand what governmental organizations such as the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection are doing to restore and protect natural resources and the environment.

1. The student understands historical chronology and the historical perspective.
2. The student understands the world in spatial terms.
3. The student understands the interactions of people and the physical environment.
4. The student understands the role of the citizen in American democracy.
5. The student understands how scarcity requires individuals and institutions to make choices about how to use resources.
6. The student understands the characteristics of different economic systems and institutions.

Foreign Languages

The Envirothon requires students to be aware of the differences and similarities between natural environments throughout the world, and how people of different cultures utilize the natural resources and environments in which they live.

1. The student recognizes that cultures have different patterns of interaction and applies this knowledge to his or her own culture.

The Arts

Health Education and Physical Education

The Envirothon emphasizes the tie between human health and the health of the environment. Students who participate in the Envirothon learn how the maintenance of healthy water, air, and soil will have a direct and positive impact on the living organisms in the environment, including humans.

1. The student comprehends concepts related to health promotion and disease prevention.
2. The student analyzes the influence of culture, media, technology, and other factors on health.
3. The student knows how to use goal-setting and decision-making skills, which enhance health.
4. The student knows how to advocate for personal, family, and community health.

SAMPLE ENVIROTHON TEST QUESTIONS

The following questions were written by resource professionals from a variety of governmental and non-governmental organizations, and covers forestry, aquatics, soils, wildlife and current issue categories. The current issue topic changes each year.

Soils Station

1. You are a land manager who has received some funds to purchase wetlands in Palm Beach County. You want to make a choice that will help maintain species richness. Given this goal, which of the following available areas would be the best choice (all choices represent the same amount of dollars).
 - a) purchase a large (180 ha) isolated wetland
 - b) purchase 10 additions (20-30 ha each) to an existing marsh complex
 - c) purchase 20 isolated, small wetlands (30 ha each)
 - d) purchase 10 interconnected small wetlands (30 ha each)

2. You are the local golf course manager and have determined the soil permeability on four sites of the golf course. They are 0.6 in/hr, 0.45 in/hr, 3.2 in/hr, and 6.8 in/hr. Which site is most likely to pose a chemical leaching (soileach) problem?
 - a) 0.6 in/hr
 - b) 0.45 in/hr
 - c) 3.2 in/hr
 - d) 6.8 in/hr

3. A major advantage to using wetlands for recycling wastewater is _____.
 - a) wetlands are already subject to overflow
 - b) wetlands receive a moderate supply of nutrients on a continual basis
 - c) wetland vegetation is already adapted to periodically flooded conditions
 - d) wetlands have a dense algal population which can be used for chemical uptake

Forestry Station

1. Using the Biltmore Stick located on your table, the tree with the red tape has how many merchantable logs?
 - a) 1 1/2
 - b) 2
 - c) 2 1/2
 - d) 3

2. To reduce summer heat, on which side of a house should a buffer zone of living vegetation be planted?
 - a) north
 - b) south
 - c) east
 - d) west

3. Standing with your back to the double pine trees flagged with blue survey tape, what is the compass bearing of the cabbage palm flagged with yellow survey tape?
 - a) 90°
 - b) 220°
 - c) 270°
 - d) 40°

Aquatics Station

1. The over-all general direction of water flow, or the hydrological pattern for surface waters within the Okeehetee watershed that you have seen can best be described as _____. (use the topographical overlay, found on the table, with your park map)
 - a) from South to North
 - b) from East to West
 - c) from West to East
 - d) from North to South

2. Calculate the approximate rate of ground water movement given the following aquifer properties: hydraulic conductivity (K) = 10⁻² cm/sec; hydraulic gradient (dh/dl) = 0.046; effective porosity (n_e) = 0.4. (Note: refer to Attachment A for equations, charts and unit conversion information. A calculator is provided.)
 - a) 0.1 meter/day
 - b) 1.0 meter/day
 - c) 10 meter/day
 - d) 100 meter/day

3. Which of the following groups of pesticides is responsible for the most significant occurrences of ground water contamination?
 - a) organo-phosphates (highly toxic to humans; breaks down rapidly in the environment)
 - b) carbonates (soluble in water; weakly absorbs to soil particles)
 - c) inorganic compounds of arsenic, lead, copper, or mercury (non-biodegradable; strongly absorbs to soil particles)
 - d) chlorinated hydrocarbons (low solubility in water; strongly absorbs to soil particles)

Wildlife Station

1. The box turtle is a species that would be commonly found at this upland site. In this region, what natural and man-made occurrences could change the physical nature of the box turtle?
 - a) blindness due to extreme heat or pesticides
 - b) predatory marks by animals or humans
 - c) fire scars made by natural brush fires
 - d) peeling shell due to heat or chemicals

2. The gopher tortoise population is expected to decrease 68% between the years 1975 and 2000. Gopher tortoises have few natural enemies. Their decrease in population can be directly attributed to human increase in population. Given the above information, as we approach the year 2000, which of the following is not a viable option to halt the decline and stabilize the gopher tortoise population?
 - a) pass legislation stating that land with gopher tortoise populations remain undeveloped
 - b) research carrying capacities of gopher tortoise communities to determine how many relocated animals can be added to existing communities
 - c) reinstate the practice in which developers mitigate (pay a fee) for destroying gopher tortoise habitat
 - d) use mitigation fees to purchase land for recolonization by gopher tortoises

3. Observe the skulls on display. The skull that represents a fox is shown as
 - a)
 - b)
 - c)
 - d)