



# New Jersey School of Conservation

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## Survival with Orienteering

### INTRODUCTION:

The NJ School of Conservation is surrounded by over 15,000 acres of forest land (for perspective, the fenced off corral area on the Sequoya side of campus is about 1 acre). In order to effectively adhere to our mission of instilling an environmental responsibility to those that wander through, we must first provide a safe way for students to navigate through the forest. In this class, students will have an opportunity to navigate throughout Stokes State Forest with the use of compasses and trail markers. Additionally, they will learn methods on how to handle moments of confusion that they might encounter when exposed to what can be an overwhelming amount of land. At SOC we also believe confidence leads to an increased comfort level while in natural areas. If students are more comfortable in natural areas, then they are more likely to visit them, and while there, they will more thoroughly enjoy these places. Increasing anyone's enjoyment and interaction with the natural world should in turn foster an improved environmental ethic.

### OBJECTIVES:

By the end of this class, students will be able to:

1. explain the parts of the compass and how to use it to navigate through the forest when given a bearing.
2. explain how to navigate through a forest by reading trail markers.
3. explain what our 4 basic needs are and why they are important to prioritize in stressful situations.
4. explain what would be best to pack for a hiking trip.

Begin with an introduction on how to use a compass. Once the students have mastered basic compass skills, they can start along the course. The students will be challenged along the course with various stops they will need to locate using their compass skills.

### ACTIVITIES FOR HOW TO USE A COMPASS:

Before the session, the instructor should check to make certain all equipment items are available and in working condition. All compasses should have strings long enough to be worn around the neck. Compasses should not have large (bigger than 1/4") air bubbles in the housing.

1. Review different uses of compasses: piloting ships and planes, military, sports including hiking, bird watching, fishing, photography, etc.

2. Use the large demonstration compass to review the parts of the compass:
  - a) **Base Plate** - rectangular bottom.
  - b) **Housing** - circular raised portion of the compass.
  - c) **Magnetic Needle** - one half red, one half white inside of housing; **red end always points north** when the compass is held still and level. However, iron, steel or electrical devices (cameras) can affect the needle.
  - d) **Direction of Travel Arrow** - etched on base where it says "read bearing here." Should always be pointing in the **same** direction as your '**nose and your toes.**'
  - e) **Orienting Arrow** - has "sergeant" stripes and is the arrow you align with the magnetic needle after setting a bearing. (Put **RED to BED**)
  
3. Have all students practice setting a bearing and then walking a triangle or square using their compasses. First have students mark their "home base" (starting point) with something from their pocket: a stick, rock, etc. To walk squares start with any bearing at all, find a landmark, walk "X" number of steps toward that landmark, stop. Add 90° and repeat, using equal distances for each side. After 4 sides students should have returned to their "home base." For triangles use 120° and three sides. To keep sides equal in length, have students walk heel to toe.

**Once students have a basic understanding of how to use a compass, begin from the first location by the picnic tables and get a bearing to the first stop:**

**Bearing to Long House Proper from Corral picnic tables 350 degrees:**

1. Long House Proper stop #1: Discussions:
  - a. A **back bearing** is a method of reviewing your choice of a landmark. From a control locate and advance to your first landmark. Now turn and aim the Direction of Travel Arrow at the original control. The landmark you are now near will be accurate if the white end of the magnetic arrow falls directly above the orienting arrow.
  
  - b. Ask the class - **What is the worst reaction you could have to an emergency?** Answer-**PANIC!** It then follows that one of the most important things we can teach is a tool for avoiding panic. We do this by using the **S.T.O.P.** cards. Place the cards, in order, on the ground, then lead a discussion to help the class understand these four steps.

**S = Slow down.** This gives you some time. Time for the sense of panic to pass, and **Time to... Think!** How much time you need to slow down depends on your situation. For example, you can spare more time if you are lost than if your house is on fire.

**T = Think** about the factors affecting your situation, such as time of day, weather, injuries, etc. If lost, study the map for landmarks. When did you last know where you were? Are your footprints visible? Can you hear sounds of traffic? You can often find your way back if you take time to think. If you can't determine your way back, *stay where you are!*

**O = Observe** what things are available to you that may be useful (resources) to help with the situation. What do you have in your pockets or pack? What useful items can you find or make from the natural materials surrounding you? *You are trying to make yourself as comfortable as possible and also as visible as possible to rescuers.*

**P = Plan** your actions. *Your plan should consider how to best use your resources and your energy.* If you have followed the STOP sequence your plan will be the best available to you and therefore you probably should stay with this plan.

Gain control. Your mind is a tool, which when in control can be used constructively, or destructively when panicking. The **S.T.O.P.** exercise is important because it helps reduce panic, which is critical in emergency situations. **It has been said by survival experts that survival is 80% mental (keeping a positive mental attitude), 10% skill (knowledge), and 10% equipment (specialized resources).**

### **Bearing to stop down near Flatbrook 305 degrees:**

#### 2. Flatbrook stop discussions:

a. Ask the students to name the four needs we have as humans (which are the same needs as all other animals). As they identify the needs, place the corresponding card on the ground in front of the group. Then ask the class to assign a time card to the appropriate need card. A general rule of thumb is, you can survive for approximately:

**3 minutes without air,**  
**3 hours without shelter** (in average weather for N.J. ~ 50 degrees, realizing that clothing and fire are shelter)  
**3 days without water,** and  
**3 weeks without food.**

This exercise is important because it **identifies** and **prioritizes** our needs, which is something that is essential in emergency situations.

### **Bearing to fire pit plateau area 229 degrees:**

#### 3. Plateau area discussions:

##### a. Fire starting experiments:

- i. In your pack there should be 2-3 options to start a fire: steel wool, Fritos, and cotton balls soaked in vaseline. There should also be 2-3 options for combustion: flint and steel, matches and a lighter.
- ii. Have students weigh the pros and cons for each of the options then hypothesize which options will work best.
- iii. Conduct the experiments and determine the conclusions.

##### b. Alternate discussion if the weather conditions are not good for fire starting:

i. Explain to the group that we will be in a simulated survival exercise for this class. Lay the contents (see materials above) of daypack on top of the tarp with the group surrounding the tarp. Have the group choose 8-10 items. The items they chose should represent those items the group feels are most important or most useful. If you want you might also ask the students to rate them from 1-5 with 1 being the most important item. The group should be able to give the reasons for the top 5 selections. Review with the class those items selected as well as those resources not selected. All items in the pack are useful in some way.

**Scenario:** Imagine our group was in a helicopter that crashed in the mountains of northern New Jersey. The pilots did not survive the crash. Your assignment is to keep everyone in your group alive. Before the helicopter explodes the group only has enough time to get themselves and the 8-10 items out of it.

The group can take as much time to discuss the items as you wish.

The following are some possible uses for the items in the survival pack. Items in **BOLD** are **probably** better choices than those items printed in *italics* for our students, although all are useful.

- **Tarp** - Shelter. Probably top choice
- **Metal can** - Boil water, cook food, collect or carry things
- **First aid kit** – Important to be prepared
- **Hat** –Extra clothing–hypothermia, cooler temp. at night
- **Flashlight** – signaling (three flashes)
- **Flint & Steel/Lighter** - a fire needs spark, air & fuel
- **Whistle** - signaling – 3 whistles for help
- **Pocket knife** - versatile, helpful with shelters, fire, food
- **Garbage bags** – provides shelter, poncho
- **Steel Wool** – One of the few things to make fire from a spark
- *Newspaper* – Fuel for fire
- *Reflecting device* – Signaling, reflect sunlight
- *Map & compass* –Knowledge needed
- *Bandanna*– versatile, signal, rope, trail marker
- *Snack* – Extra food - people need food
- *Water bottle* – people need water, can't boil in plastic
- *Watch* – Determine direction, & time

Ask the group if this crash really did happen what would they do first?

**Check for injuries!**

**Bearing up wire to top of hill off Orange Wood Lily trail 229 degrees:**

4. Shelter Building:

a. It is the month of \_\_\_\_? \_\_\_\_. The wind is picking up, temperature is dropping and dark clouds are gathering. What should your group begin to do? **Build shelters**. If they are building a tarp shelter they will need to work as one team, if you want them to build debris shelters then they could work in one, two or three groups. They may use any of the materials chosen in the beginning of the session.

**For debris shelters the groups should not use any living plants, move buried rocks, or cause any harm to the environment.**

\* Leaders' information: To be shared with students following their attempt to construct shelters.

b. **Size:** Should be just big enough to shelter the builders. If too large your body heat which warms the shelter will be less effective.

- c. **Sturdy:** Able to stand up to wind, rain, and snow. Use a tree, log or rock as a foundation or structural support.
  - d. **Wind:** Door should open opposite the direction of wind and be as windproof as possible.
  - e. **Rain/Snow:** Waterproof. Sloping roof tends to shed water better.
4. **Insulation:** Must hold in the warm air. Dead tree leaves work great. Piled up to three feet thick.

*Always consider whether the amount of energy you will save by being protected from the elements will be greater than the amount of energy needed to build the shelter.*

**\*\* TAKE DOWN AND SCATTER ALL MATERIALS USED FOR SHELTER BUILDING ! \*\***

**Bearing back to campus 180 degrees to the road, make a left onto the road back to campus:**

## **BIBLIOGRAPHY**

1. Drury, Jack and Bonney, Bruce, (1992). *The Backcountry Classroom: Lesson Plans for Teaching in the Wilderness*. ICS Books, Merrillville, IN.
2. Kjellstrom, Bjorn. (1976). *Be Expert with Map and Compass: The Orienteering Handbook*. Scribner's Sons, NY.
3. Ludwig, Gail. (1983). *Map and Compass: Instructor's Manual*. Missouri Dept. of Conservation, Jefferson City, MO.
4. Jacobson, Cliff, (1999). *Basic Essentials: Map and Compass*. The Globe Pequot Press, Guilford, CT.
5. For information about Orienteering events in North Jersey /Southern Tier of New York region visit the Hudson Valley Orienteering Club at: [www.geocities.com/Yosemite/8761/](http://www.geocities.com/Yosemite/8761/)
6. For information about Orienteering events in southern New Jersey and Pennsylvania contact the Delaware Valley Orienteering Club at: [www.dvoa.us/orienteering.org/](http://www.dvoa.us/orienteering.org/)
7. Brown, Tom, Jr. (1983). **Tom Brown's Field Guide to Wilderness Survival**. Berkley Publishing, New York.
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9. Boy Scouts of America. (1984). **Fieldbook**. Third Edition. Irving, TX.
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13. Risk, Paul. (1983). **Outdoor Safety and Survival**. John Wiley & Sons, Inc., New York.

## **NJ Student Learning Standards**

This field lesson touches upon the following NJ Performance Expectations and may also be tailored to focus on any of the following standards

### **Mathematics**

- MP.2 Reason abstractly and quantitatively.
- MP.4 Model with mathematics.

### **HS-PS3: Energy**

- HS-PS3-5 Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

### **Comprehensive Health and Physical Education**

- 2.2.8.MSC.1 Explain and demonstrate the transition of movement skills from isolated settings (e.g., skill practice) into applied settings (e.g., games, sports, dance, recreational activities).
- 2.2.8.MSC.7 Effectively manage emotions during physical activity (e.g., anger, frustration, excitement) in a safe manner to self and others.
- 2.3.8.PS.1 Assess the degree of risk in a variety of situations, and identify strategies needed to reduce deliberate and non-deliberate injuries to self and others
- 2.2.8.LF.4 Identify and recognize factors that generate positive emotions from participating in movement and physical fitness activities.
- 2.2.8.LF.5 Engages in a variety of physical activities (e.g., aerobic-fitness, strengthen, endurance-fitness activities) using technology and cross-training, and lifetime activities.

### **Career Readiness, Life Literacies, and Key Skills** **Critical Thinking and Problem-solving**

- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global

## **MS-ETS1: Engineering Design**

- MS-LS2-1 Analyze Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

## **Scientific and Engineering Practices / NGSS**

This field lesson can be tailored to have students directly involved with

- Asking Questions and Defining Problems
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

## **Social and Emotional Learning**

All of our field lessons integrate the concepts of self-awareness, self-management, social awareness, responsible decision-making, and relationship skills found in the [New Jersey's Core Social and Emotional Learning \(SEL\) Competencies](#).municating Information