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ABSTRACT

Orienteering has been described as being "either a serious sport, or a relaxing recreation". Orienteering can be a family affair or an individual fight against the clock. In its simplest form, orienteering can be described as a cross-country run, jog, or walk on a predetermined course, using a map and a compass to find several control points on the way. Orienteering realizes an ideal balance between the intellectual and the physical. It requires an integration of physical skills and conditioning with intellectual expertise. Since there are many ways to analyze and navigate land surfaces, orienteering incorporates a highly individualized combination of one's own abilities and judgment. This paper (1) defines "orienteering" for the educator; (2) acquaints the educator, whether school administrator or teacher, with basic orienteering skills; (3) presents a rationale for the inclusion of orienteering in those areas of the school curriculum wherein it can be utilized advantageously; and (4) acquaints the educator with the factors that must be considered in establishing an orienteering program.
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INCORPORATING ORIENTEERING IN SCHOOL PROGRAMS

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by

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INTRODUCTION

This paper has been prepared to (1) define "orienteering" for the educator; (2) to acquaint the educator, whether school administrator or teacher, with basic orienteering skills; (3) to present a rationale for the inclusion of orienteering in those areas of the school curriculum wherein it can be utilized advantageously; and (4) to acquaint the educator with the factors that must be considered in establishing an orienteering program.

DEFINITION OF ORIENTEERING

Peter Nicholls, writing for the magazine Australian Outdoors, described orienteering as being "either a serious sport, or a relaxing recreation." Orienteering can be a family affair or an individual fight against the clock. In its simplest form, orienteering can be described as a cross-country run, jog, or walk on a predetermined course, using a map and a compass to find several control points on the way.

Orienteering realizes an ideal balance between the intellectual and the physical. It requires an integration of physical skills and conditioning with intellectual expertise. Since there are many ways to analyze and navigate land surfaces, orienteering incorporates a highly individualized combination of one's own abilities and judgment.

AN OVERVIEW OF THE BASIC SKILLS ESSENTIAL TO SAFE ORIENTEERING

This section of the paper is not designed to be used as a guide for teaching orienteering, but only to present an overview of some of the skills involved in the sport for the benefit of those readers who have had no contact with it. This section may provide such readers with some idea as to the scope of the subject. Teaching guides do appear in the teaching resource section of this paper.

In the initial phase of an orienteering program, students receive instruction in map reading skills. It is not enough simply to be able to interpret map symbols in the classroom; the student must be able to relate map features with corresponding ground features.

Students must be able to recognize map symbols and comprehend their meaning. Exercises such as mapping the classroom, in which the student may be free to invent his own symbols, are helpful in developing this basic skill. It may be difficult to teach students the meaning of contour lines; therefore, introducing them only as indicators of elevation may be advisable. (That is, the closer the lines are together, the steeper the terrain and the farther apart, the flatter the terrain.)

Once students understand symbol language, they may learn to orient their maps to their surroundings. It is possible to use the maps of the classroom or maps of the schoolyard to teach this skill. Have the children stand in the schoolyard and orient their maps to their surroundings. The children may have trouble understanding that their maps always "lie the same"; that while they may change direction, their maps will not, since maps represent immobile features. It may help to instruct a child to walk

to a series of premarked locations and to keep his map oriented relative to these positions, so that when he changes directions, he must change the position of his map accordingly. The map must always be an accurate reflection of the student's position to his surroundings; that is, those things depicted on his right on the map must be on his right as he walks,

In order to utilize a map effectively, it is essential that students understand distance and scale. In orienteering, the only means of measuring distances traveled is through paces walked. Consequently, a relationship between paces and map scale must be determined. To determine this relationship, establish a 50 meter distance. Have the student walk this distance twice, counting each time his right foot descends. He will then have arrived at his pace count for 100 meters. For a running pace, count the number of times the right foot hits the ground as the student runs 100 meters. Now the student should be prepared to pace off distances indicated on the maps.

Have the students use the schoolyard map to develop a scale by pacing off distances between various features. If the teacher can make topographic maps available, he may reverse this procedure, and have the students calculate distances from the scale and pace them off to determine the accuracy of the pacing method. If topographic maps are available, the teacher should review the concept of contour lines. The teacher may take students, equipped with maps, and walk from a designated location to a destination indicated on the map. As they walk, students should keep their maps oriented at all times to the physical features about them. Have the students identify contour features in the terrain and compare them to their map representations. This exercise might be a good opportunity to pace count as a check on the distance students actually travel versus the scale

distance to the destination. Students may note changes in pace count due to ascents or descents.

Once the student has mastered these basic skills, he is essentially ready to begin orienteering. He can map read! At this point, the teacher should introduce the orienteering compass. The orienteering compass has three basic functions. It is used to orient the map to the surroundings, to read distances via the scale on its base plate, and to take a direction or bearing from the map. Orienteering compasses are sold with very detailed directions regarding bearings, usage with maps, magnetic declination, etc.

The compass must not be relied upon as a major tool. It isn't; the map is! The compass is, however, a safety feature, one that the student may use to follow a relatively straight line in the event that he gets lost. Generally, a safety bearing is given before starting a course. This bearing is a heading to follow if lost and will guarantee an encounter with a road or other such recognizable feature.

When the student has mastered the basic skills of map reading and those related to the use of the compass, he is, in essence, prepared for most forms of orienteering.

Skills Progression for Teaching Orienteering

Complete Novice

- map symbols
- map scale
- orienting the map using the terrain
- compass parts

- using the compass to orient the map
- taking a bearing

Secondary Skill Progressions

- keeping the map oriented to the terrain
- thumb reading the map
- holding the compass
- route choice - catching interesting features
 - check points
 - attack points
 - hand rails
- control simplification - off aiming
- distance judgment - on the map
 - measured in the terrain (pace counting)

NOTES TO THE TEACHER

The educator who wishes to teach orienteering, either because of its value as a sport or because it may be an exciting study vehicle, must be personally prepared for all demands.

The educator who has no knowledge of orienteering either must involve himself in a training session or develop one on his own in order to develop orienteering skills himself. At no time should the instructor overstep his own limits of competency in this field. A gradual progression of orienteering experiences from initial practice games to competitive point-to-point orienteering will build confidence and knowledge and better prepare the teacher for all situations he might encounter with his students. The book Your Way With Map and Compass by John Disley is an excellent resource for games and exercises to develop and refine orienteering skills.

The educator who decides to use orienteering for physical education training, to teach geographical skills, to provide practice in metric math, for creative writing, or for various other reasons, must evaluate the forms of orienteering which best suit his needs. At this point he must evaluate the resource at hand. Does he have the maps, the mapped area, the personnel, the equipment, the transportation, etc., that this form requires? If not, are modifications possible?

The personnel requirements for point-to-point orienteering vary considerably from those for route orienteering. What happens if, on a point-to-point course, some students get lost? Does the instructor have the resources to search for them? Has he evaluated the terrain for such possibilities and prepared the course to minimize them? To help avoid trouble,

the educator may train a small group of tutors. The tutors could be students, handpicked for reliability, or parent volunteers. These individuals can then serve as trouble shooters for the expected or unexpected situation. Having a well-informed, trained individual at a potential trouble spot can be especially helpful to novice orienteers.

The teacher must consider the terrain. Is it physically safe, free from major hazards? No cliffs, landslides, hunters, etc.? The instructor should know any area to be used for an orienteering session as well as possible, since "impossible" happenings do occur. The educator should be trained in First-Aid and should carry a First-Aid kit and be prepared to handle most emergencies. The students themselves might also be given basic First-Aid training. Each student should have a solid grasp of the theories behind and practice of artificial respiration, should know how to arrest bleeding in deep wounds, and should have some knowledge of splinting and bandaging.

Hypothetical Situation

What does a teacher do when a student is lost? Students should be prepared to get lost. They should understand what safety-bearings are. Trained tutors may be stationed at points at which any lost student, if he follows that bearing, may be expected to emerge. If the student was last seen at Point X, the teacher should evaluate the mapped course for potential places of error from that point on. Tutors may check those places and regroup for further evaluation of the situation, whether the student is found or not, at an agreed-upon central point.

If it is necessary to instigate a search, the instructor may use his students to establish a search pattern. The Canadian Orienteering Federation

recommends a method in which the searchers form a line abreast separated by twenty to thirty feet (more if visibility is good and less if not), and they number themselves consecutively from the head to the tail of the line.

Upon commencing the search, the leader calls out his number "1", the second searcher follows with a "2", and so on across the line to the tail. When the tail searcher shouts his number, he reinstates the count in reverse. Should a person calling his number not hear the next, he shouts "stop". This message is passed down the line. Since the searchers are not far apart, the call will probably be heard by both sides of the line. The searcher who institutes the halt then calls his number again. If there is no response, it can be assumed that the searcher beside him has been hurt or has trailed off. No one continues with the search until he is secured. The possibility of an individual getting lost is negated in this manner. This search pattern permits an organized coverage of a large area and prevents overlooking small sections. The routine being employed served to calm people and thereby prevents other persons from getting lost while searching.

The educator wishing to utilize orienteering must exercise common sense. He must understand orienteering and basics well and he must be prudent and thorough in his preparation of his students and aids to be taken. He must know the area and maps to be used and be prepared for the unexpected.

Depending upon the availability of personnel and upon the age of the students and their skills development, the educator should seriously consider the ramifications of sending the student on a course alone. If the student is adequately skilled, if reliable personnel have been placed about the course as trouble shooters, and if the student feels confident about going alone, and if the course has been competently planned and preparations

for setting the course have been made, the student may very well start off on his own. If students are participating in a competitive orienteering meet of the sports nature, they may be anxious to go alone. If the orienteering course is designed to enhance the teaching of an academic theme, or if the students are beginners or quite young, it is probably better to send students out in groups of two or three. In case of an injury to a student, the remaining two can assist the injured classmate. One can stay to provide assistance while the other can go for help, if needed.

Students must be as well prepared as possible for emergencies. Each student must be taught to determine the position of his small group on the map, as a return trip with a "rescue party" never looks the same. The student should also know enough first aid to be able to determine to some degree the nature of any injuries, helping to assure that required supplies are furnished by the rescue party. It may be worthwhile to have each student carry a playground whistle sealed in a plastic bag, which should be used only in emergencies to summon help. Whistles can be heard for two or three times the distance that a shout will carry in a wooded area. A student who realizes he is lost or who is injured may not be hard to find if he blows his whistle at regular intervals, say about 30 seconds to a minute apart, while he remains at one spot.

For instance, an actual group of fourth- to sixth-grade students on an orienteering course in a mixed and sugar maple wooded area, who had an excellent map prepared by the Quebec Orienteering Association, were confused by a very heavy fog which rolled in during the morning. These students were in groups of three and they had run four or five courses prior to this one. However, with the fog reducing visibility to less than 50 feet, they had to rely strictly upon their compasses; they couldn't read

the terrain. Out of 12 groups of students, two strayed off course. One group realized that they were off course and elected to follow the safety bearing. They made their way to the highway and back to the bus. The other group, realizing they were not on course, and unable to determine where they were, elected to stay put and commence the whistle routine. The instructor, looking for them, passed twice within 200 meters of their position before hearing the whistle faintly. Had they not had or used a whistle, he might have spent several hours searching for them, as their voices most certainly wouldn't have pierced the fog to any great distance.

An instructor who depends upon a bus to transport his students to an orienteering site should be aware that, generally speaking, school bus drivers have commitments with respect to bus runs. This may be awkward if one or more students have not returned to the bus by departure time and the driver has to leave, unless the teacher has provided alternate transportation. If someone gets hurt, the instructor may find a second means of transport to a hospital absolutely necessary. A car might be considered an essential piece of orienteering equipment.

NOTES TO THE SCHOOL ADMINISTRATOR

Administrators may view orienteering as a viable and worthy addition to the school program. Administrators who wish to incorporate orienteering in a school program must consider several items.

First, consideration must be directed to the availability of properly trained staff. It is essential that participating instructors be knowledgeable about basic orienteering skills, and that they have some actual experience in orienteering, since it is only through experience that an instructor will be able to understand the situation as the student sees it. Furthermore, the in-field experience a teacher gains prepares him for the considerations essential in course setting. The orienteering instructor must also have some training in First Aid procedures, not only for the safety of the students, but for his own self-assurance as well. Interested administrators may contact the closest Orienteering Federation to find out about training programs available for educators. In many instances the Federation or provincial or state associations (see resources) are willing and prepared to provide workshops on aspects of orienteering, whether it be beginning skills, map-making, course setting, or advanced orienteering skills. If not, they will still be valuable resources for and can provide training materials (films, games, books, pamphlets, etc.) for in-service workshops.

Once the administrator has obtained competent instructors, he must consider the problems of obtaining parental permission for student trips, of getting adequate insurance, and the amount of student time involved. Parental permission forms are available for special events. If orienteering is to be offered as part of the curriculum, a student's participation may be viewed as might be his participation in a football program or industrial

arts program. There are risks in any case, but they have been considered and covered as far as possible. Insurance coverage will probably be easy to obtain as long as proper and adequate instruction and preparation in class and in the field have been provided, as long as supervision is adequate, and as long as orienteering is part of the curriculum. In fact, the regular school insurance policy will probably cover this program. Just as the insurance policy provides protection for the school board, administration, teachers and students in a football program involving adequate and proper student preparation and supervision, it should cover orienteering.

The question of student time involved should not be viewed from a negative or detractive standpoint. A successful program of training and instruction may be carried out in a program lasting one hour twice a week for ten weeks. Special arrangements for extra time would probably be essential for running more comprehensive courses, such as interschool orientation meets. If orienteering is viewed as an integral aspect of the curriculum, or even as an elective activity within the curriculum structure, there should be no problem whatsoever with considerations of time.

The cost of an orienteering program will be of concern to an administrator. Obviously, the solution to this problem varies with each situation. The highly motivated, resourceful instructor can run a successful program on a zero-cost basis, whereas the instructor who lacks such resourcefulness may require funding for maps, equipment, and transportation. An orienteering program requires, first, an interested and resourceful instructor. Competitive orienteering maps are not essential to a school program. Hand-drawn maps, maps of school facilities, town maps, county maps, and topographical maps can be obtained and duplicated for minimal or no expense. If a mapped orienteering area is within reasonable range, maps are usually available

through the Orienteering Federation for 50¢ to \$1.00 each, and these too can be duplicated inexpensively.

Equipment need not be expensive. Only minimal outlays for bottom-line compasses and playground whistles are needed. However, compasses are not essential to orienteering. The map is the primary requirement; the compass is a secondary consideration. Furthermore, compasses are often available through the Federation on a short term, free loan basis; any person wishing to borrow compasses may contact the school services branch of the Orienteering Federation, or check with the Scouts or Guides to see if they have equipment which can be borrowed.

The final consideration in cost assessment is linked to transportation. Unless the instructor plans to bus students to mapped areas, this cost becomes negligible. Adequate training sites are generally available within walking distance. These may include schoolyards, residential areas, and parks. The occasional use of wilderness sites or similar areas could be included in the orienteering program if funds were available for such excursions.

An orienteering program is a feasible and constructive supplement to a curriculum. The outlined considerations can be readily met and obstacles surmounted if teachers are enthusiastic and adequately trained. Furthermore, because of its nature, orienteering itself leads to discipline. Orienteering is both a device for controlling student groups out-of-doors and a vehicle for instruction. Its flexibility is only restricted by the limits of the instructor's imagination.

Outlined in Table 1 are principal variations of orienteering with comments regarding their use. This list is not exhaustive, but provides the key to flexible use of orienteering as a teacher tool.

TABLE 1
MAJOR FORMS OF ORIENTEERING

<u>Forms (Structures) of Orienteering</u>	<u>Basic Principles & Comments for Teacher Usage</u>
Point to Point	This form of orienteering entails traveling between a sequence of carefully selected points. Usually it involves the use of maps and compass. The terrain generally covered is wooded and rolling. These courses cover from 2 to 15 kilometers and are designed to test the student's ability to select a suitable route.
Miniature Orienteering	This is a variant of the point to point structure and can function successfully on a moderately large school ground. It permits practice of distance and directional concepts or skills while maintaining close group control.
Score Orienteering (Control: A point usually marked on a map used for orienteering which is to be reached usually within a certain period of time.)	This format involves the collecting of as many control points as possible from a large number of controls within a set time. Points are allotted at each control, the more difficult being weighted accordingly. The set time

TABLE 1 (Cont'd)

Forms (Structures) of
Orienteering

Basic Principles and Comments for
Teacher Usage

Score Orienteering (Cont'd)

permits adapting such exercises to school timetables. This type of exercise can be used with individuals or groups. Since individuals select their own routes, the problem of students following one another is reduced. The use of sketch maps without compasses is quite appropriate. This form of orienteering can be done in open or wooded areas, or in a schoolyard (miniature score orienteering).

Line Orienteering

Participants are given bearings to follow, and they locate the controls en route. This format gives a high degree of control over the students and can be designed to include a variety of project sites. This form of orienteering requires basic map and compass skills. The amount of space needed depends on the instructor's objectives.

Route Orienteering

The route is marked out on the ground (streamers can be used) and the objective

TABLE 1 (Cont'd)

Forms (Structures) of
Orienteering

Basic Principles and Comments for
Teacher Usage

Route Engineering (Cont'd)

is to mark the exact location of the controls encountered on the maps. This is the best "control" situation in that the student can't get lost. This format is primarily a test of map reading skills. This form lends itself to project development, and is easily adapted to winter use, as a trail can be laid in the snow.

Project Orienteering

This is a variation on most forms of orienteering, wherein, upon reaching a control, an exercise or project is to be completed. These exercises or projects can be derived from any discipline.

Other variants of basic formats are night orienteering, water orienteering, relay orienteering and bicycle orienteering.

The instructor, having prepared himself to teach orienteering and having provided basic skills instruction to his students, may want to integrate his academic programs and his orienteering program. Enthusiasm, time, and imagination are prime requisites at this stage.

Table II may suggest some curriculum adaptation possibilities.

TABLE 2

<u>Academic Discipline</u>	<u>Activity Ideas</u>	<u>Orienteering Form and Comments</u>
Art	<ol style="list-style-type: none"> 1) woodcraft-carving 2) drying & dyeing of fungi & lichens for decoration 3) seed collection collages 4) rock collection, polishing & cutting mosaics 5) nature prints 6) spore prints 7) sketch, paint scenes, etc. (frame a few & sketch) 	Route and line orienteering in conjunction with the project approach are the most easily adapted forms considering student control. A variation on score orienteering could be readily employed. A minisature score course might facilitate completion of the assignments and greater group control.
Geology	<ol style="list-style-type: none"> 1) rock structure & formation studies 2) sample collection of soil rocks (classification) 3) study of glacial action 4) weathering 5) fossil studies 6) mine site studies 	Depending on the objectives, route and line orienteering can be suitable, but given some specific themes, point-to-point orienteering could be effectively instituted.
Mathematics	<ol style="list-style-type: none"> 1) degree measurement 2) triangular geometry 3) metric concepts 4) distance measurement 5) conversion of map scales 6) problem solving techniques 	Compass games and any form of orienteering exercise will provide a concrete experience relevant to math concepts. The whole approach to running an orienteering course is a study in problem solving skills and is in itself a valuable lesson.

TABLE 2 (Cont'd)

<u>Academic Discipline</u>	<u>Activity Ideas</u>	<u>Orienteering Form and Comments</u>
Geography	<ol style="list-style-type: none"> i) stream studies 2) erosion studies (wind, water) 3) watershed studies 4) physiographic features <ol style="list-style-type: none"> a) gullies b) deltas c) meandering streams d) alluvial deposits e) stratification 5) sand dune studies 6) ecological studies 	<p>The choice of method employed here is dependent on the area to be covered and whether the subject taught is general or specific. A wayfarer approach involving a group of three working as a unit may be good. This approach would permit in-depth studies of specific subject areas, allowing for photos, sketches, samples and written observations.</p>
Botany	<ol style="list-style-type: none"> 1) studies of <ol style="list-style-type: none"> a) plant growth b) classification c) diseases d) structure 2) area studies 3) study environment of specific plant families 	<p>Depending on the range of the subject, various forms of orienteering will offer special advantages.</p>

ORIENTEERING AS A VEHICLE FOR TEACHING ACADEMIC DISCIPLINES

Educational institutions attempt to provide students with a "living knowledge" from which to generate ideas. Teachers must usually rely upon textbook resource information, a rather unfortunate reality considering the wealth of living knowledge available firsthand. Consider for a moment the fifth grade science pupil studying plant communities or the ninth grade geography student studying natural weathering agents. Texts have ample information about weathering, but old stone foundations and old tombstones have even richer stories to unfold relating to plant life and weathering. Utilizing these out-of-school resources requires insight on the part of the instructor, who must be able to relate physical objects to the field under study. The instructor must help the student to make his own discoveries, and then guide him to text resources that can broaden his new-found discoveries. Skillful use of the out-of-door classroom may greatly enrich the curriculum and will stimulate and excite students.

The teacher may wonder how to handle twenty-five students when they aren't at their desks or contained by four walls. If he views the students as energetic, curious, and in need of guidance, rather than simply anxious to escape the process of education, he may find that discipline is not a major problem. A sample paper handed out on a point-to-point orienteering course follows. This particular program was interdisciplinary in nature, although it stresses environmental and ecological considerations. It was used with a group of teachers who had requested a program demonstrating the vehicular application of orienteering.

Between Control #1 & 2

(1) Consider the environmental impact of this hydro line on the ecology of this immediate area. (direct & indirect factors and relationships)

(2) Consider the variance notable between the woodlot (S-SW side of hydro line) growth and that of the "hydro slash" (can be a comparison of species or levels of developments). (Note also the variances of the woodlot area to the N-NE side of the "slash".)

At Control #2

Within a radius of 40 feet, note evidence of at least 3 edible forms of plant life (not necessarily commonly eaten).

On rock formation, base of which Control #2 is located

Study closely this mini-environment and develop a hierarchy of levels of vegetation growth within this slash. (Consider the functions of each developmental stage within the total forest environment.)

Between Controls #1 and #3

You will have noted several piles of stones. Explain the existence of these piles in terms of original function. (Man's relocation of these stones has probably provided several new mini-environments. What life-forms would you expect to discover in these piles, animal and/or vegetable?)

At #2

Pause and reflect upon what you have seen and on what you have been asked to consider to this point. In light of this information, what could you conclude about this area? That is, what do you think this area looked like 50 years ago? How might it have differed from what you see today?

Just Past Control #3 (40-60 Meters)

On the west side (right) of the trail is a low pile of stones. A closer study of this pile reveals several things: (a) Compare this pile in terms of vegetation to the piles on the slash. What does this tell you about age or passing time? (b) Why is the pile here? What does this tell you about this area's past? (c) Tie this together with your thoughts from the preceding question at #3.

Between #3 and #4

At the junction of the new trail: (a) using your map, what assumption can you make regarding the function of this trail? (b) What impact does it have on the natural environmental balance?

As you Approach #4

Do you notice any changes in the overall forest makeup?
(a) if so, what are they?

As you Approach #4 (Cont'd)

(b) What reasons can you put forth to explain this change in view of what you have seen so far?

At Control #5

What signs of animal life can you see at, in, or about the building?

Between Controls #5 and #6

About midway between these two controls you find yourself in an environment somewhat different. (a) Using your imagination, trace the possible development of this mine area to its present state.

(b) Notice the large up-turned roots of the fallen trees. What reasons can you give for these trees being knocked down?

(c) Notice an unpleasant feature. Where do the "prickers" grow primarily between #5 and #6?

After #6

(a) What explanations can you give for the notable difference in the undergrowth development among the conifers on the north side of the trail as compared to the growth on the other side of the trail?

(b) Is there any evidence of animals?

Between #6 and #7

There are numerous fallen trees between these controls. These trees provide you with an opportunity to study fungus development. Numerous varieties abound, each with specific characteristics.

(a) What functions do fungi serve; are they essential?

(b) Do you see signs of life in these fallen trees assisting in the decaying process? Notice the texture of the wood in some of these trees and the smell. (c) Do you notice the fungus growing on any particular portions of the trees? What conclusions could you make about the growing requirements of fungi?

At #7

Looking at your map, considering the course set up, what would you, as an instructor with a group of students, be conscious of? What precautions would you take?

On your map, the small stream you have crossed to #7 is marked as an intermittent marsh. Interpreting the land forms, can you explain why this feature exists and why it is classified as intermittent?

En Route to #9

After checking into #8 and as you proceed toward #9, you will notice a change in the forest environment. Notice the fern growth and mosses.

En Route to #9 (Cont'd)

What does this tell you about the stage of development in the forest floor? (Notice the colors and textures of the mosses. Feel them.)

Before you get to #9, you should be able to pick it out physically. (Use the map and your intuition. What do you expect to see?)

At #9

What's happening here?
(Think about this one.)

At #10

You can see a community. What direction is the community from the knoll and what is its name?

From #11 to #14

Attempt to use the map only.

At #11

Do you see any evidence of man's recent use? Any guesses as to reasons?

Between #12 and #13

There is a disposal area for wrecked vehicles. How does this affect you? If you were with a group of students (don the cap of the naturalist), how could you enrich a hike in the woods with this junkpile?

Questions

Thoughts and Responses

Between #12 and #13 (Cont'd)

Other Caps: Humanist
Scientist
Economist
Historian
(Your Imagination is your limit)

At #13

You have before you a good example of interdependence in nature. Elaborate. Can you think of other examples?

After #13 on Way to #14

You have two easy routes. Assuming you kept to the right, as you pass the huge maple on the south side of the path at the base of the incline, you will notice a conifer tree sprouting a rather unusual growth. Can you explain this growth?

At #14 - FINI

We will gather here before returning to the cars to discuss any areas, to brainstorm, and to ensure that all persons are accounted for.

TEACHING RESOURCES

There are many books available on the subject of orienteering. Included below are several resources which are most useful for both teacher training and student use.

1. Be Expert With Map and Compass

The "orienteering" handbook, by Bjorn Kjellstrom (published by Charles Scribner's Sons, New York) is the most comprehensive reference or resource book available. This text provides information on all facets of the sport as well as listing practice games to improve orienteering skills.

2. Your Way With Map and Compass

This workbook by J. Disley (published by Silva Ltd., 446 McNicoll Avenue, Willowdale, Canada, 1971) is available in both teacher and student editions. This workbook provides reinforcement exercises for all skill levels. It is an excellent source. A filmstrip/cassette package based on John Disley's book, Your Way With Map and Compass, is designed to be used with the workbook and is a valuable teacher resource. It is about \$90, and is available through Silva Ltd. as well.

3. Teaching Orienteering

This is a recent publication by James Gilchrist (published by Orienteering Services, 446 McNicoll Avenue, Willowdale, Canada). It is a teacher's resource book providing a logical progression of skills and exercises for orienteering students. Mr. Gilchrist has added two sections to this publication during the past year, "Organization of a Simple Orienteering Meet" and "Preparing Simple Orienteering Maps." These two chapters are valuable

resources in themselves. From the teacher's point of view, this publication could be the most useful resource listed here.

4. Games

Listed are several games that provide an interesting and entertaining way of teaching some orienteering skills.

Orienteering Map Symbol Relay Game	.50¢
Map Memory and Route Choice Game	1.00
Schoolyard Compass Game	.50
Competitive Compass Game	.50

The teacher resources, the games, and the equipment mentioned are all available either through the Canadian or through the American Orienteering Service (see addresses provided).

The following addresses are valuable in terms of information and materials available.

U.S. Orienteering Federation, P.O. Box 500, Athens, Ohio.

Canadian Orienteering Federation. P.O. 6206 Terminal A,
Toronto 1, Canada.

Canadian Orienteering Service, 446 McNicoll Avenue, Willowdale, Ontario, Canada.

American Orienteering Service, P.O. Box 547, La Porte, Indiana, 46350.

People at these addresses can provide information on competitive events, educational teaching materials, films, and equipment loans.

EQUIPMENT

As in most sports there is a variety of equipment available on the market, and as can be expected there are notable price differences among various lines. A school will probably find the Silva 7NL Polaris compass satisfactory. This model is reliable and costs about \$4.50 to \$5.00. Other models can range up to \$25.00, but the extras they provide are not necessary for the work generally carried on by students. A plastic demonstration compass, an enlarged teaching model, is a handy tool for instructing students in the use of the compass. This unit costs about \$6.00.

Maps are part of orienteering equipment, but need not be expensive. In the event that a mapped orienteering area is available in your region, maps should be available from the closest Orienteering Service for 50¢ to \$1.00 each. These can usually be duplicated, with permission, for school use, thereby cutting costs greatly.

If such areas are not available within reasonable driving time, topographic maps of the immediate area may be available. Segments of these maps can be used in a similar manner, although more care must be taken in preparing courses as these maps aren't as detailed. A more appropriate map, depending on the purpose, is one made up for the occasion by the leader. Teacher-made maps may involve student assistance. Jim Gilchrist's Teaching Orienteering has an excellent chapter on preparing simple orienteering maps.

AUTHOR'S COMMENTS

The educator considering the incorporation of orienteering in his curriculum has an arduous task ahead. The development of a complete program, one that not only teaches orienteering skills, but also integrates and extends the curriculum subject matter in a realistic framework, is not a light assignment. However, rewards such as student enthusiasm and involvement and positive feedback more than compensate for the work involved in establishing a vehicular orienteering program.

ABOUT THE AUTHOR

Douglas Bradford is currently pursuing a Masters of Science Degree at Northern Illinois University in the Department of Outdoor Teacher Education. His prior education includes a B. A. from the University of Waterloo, Ontario and a B. Ed. from Sir George Williams University in Montreal, Quebec.

He has served on the Regional School Board for the District of Bedford while teaching at the upper elementary level and is a Certified Instructor of the Canadian Orienteering Leadership Development Program at the University of Guelph. His memberships include the Quebec Council of Outdoor Education and the Canadian Orienteering Federation.