

## **OUTDOORS - MATHEMATICS BADGE - HIGHLANDS INTERMEDIATE**

### **SECTION A: You must complete THREE learning activities from this section.**

1. Pitch a 2-person tent, and calculate the following:
  - a. The area of the floor
  - b. The angle of the pitch of the roof
  - c. The surface area of the roof and walls
  - d. The volume of air in the tent
2. Design and make a 'flyer' advertising an outdoor event, camp for your class, or sporting fixture. Include in your 'flyer' map, timetable, cost of equipment or hire etc.
3. Plan and construct a tangram (7 geometrical pieces) demonstrating sports people in action.
4. Plan a questionnaire to survey the outdoor recreational activities that students at your school participate in (a) in winter (b) in summer. Analyse your data, graph your results and write your conclusions.
5. Create and produce a 'Word Find' using mathematical shapes, terms and concepts found in the outdoor environment.
6. Using materials found in the outdoors make a collage with a mathematical theme.

### **SECTION B: You must complete THREE learning activities from this section.**

1. Plan and map a cross-country course in your local school's environment. Produce a legend showing important features, measurements of distances and estimated times for girls and boys to complete this course. Carry out the event with your class or syndicate. Record and analyse the times taken by boys and girls. Calculate the range, median, mode and

average time taken by both genders. Graph your results and write a report outlining your conclusions.

2. On a grid or isometric paper, design a pattern for a tee-shirt for yourself. Create a decorative motif, for the front of the tee-shirt that promotes conservation values in the outdoors. Use paper to produce models of the tee-shirt in three different sizes. (a) yourself (b) for a five-year-old (c) for an adult.  
Make sure that the design is appropriately reduced and enlarged.
3. Design an original game that could be played by your class in the outdoors. Use graphics, diagrams and symbols to produce a description of the game explaining the objectives, rules, scoring system, playing area and equipment.
4. Devise and build a model of a 3-D maze for people of your age/size, which could be constructed outdoors. Determine and record the actual dimensions.
5. Devise a menu for your class camp for 4 days. Determine quantities of each type of food and establish costs. NB Discuss maximum cost with your teacher.
6. Plan and conduct an in-depth investigation of your own choice, which is related to the outdoors. You may wish to extend an idea or activity from another section. (NB: This investigation must have a strong, identifiable mathematics focus).

**SECTION C: You must complete TWO learning activities from this section.**

1. Identify a suitable sporting event for your class. Syndicate or school (e.g. padder tennis, athletics, swimming sports etc.). Develop a programme which includes:
  - a. A timetable of events
  - b. Draw or list of events
  - c. Map or diagram
  - d. Scoring system.
2. Design and produce certificates for place getters.
3. Produce a design for a raft which will be able to transport yourself and a friend. List and cost all the components required. Construct the raft. Remembering that only two people are able to carry it to a suitable test site (e.g. school pool). (Safety reminder – sailing of the raft must take place under supervision arranged with your teacher. Lifejackets must be worn!). Access and evaluate your raft design and determine its effectiveness.
4. Brainstorm with your class. Ideas for entertainment for a camp extending over four nights. Find percentages for each item according to popularity. Prioritise items according to these results and develop a program for each evening's entertainment (2-3 hours per night). Seek feedback from your teacher regarding the appropriateness of your programme. Publish a timetable for the programme and communicate this with your teacher.
5. Plan and conduct an in depth investigation of your own choice, which is related to the outdoors. You may wish to extend an idea or activity from another section. (NB: This investigation must have a strong, identifiable, mathematics focus).