

Preface

Participants, instructors and assessors should take note of the conditions as laid down in the Award Handbook.

This programme is for guidance and is not to be taken as a rigid syllabus. To indicate the content appropriate to young people with varying degrees of knowledge and experience, it is arranged under three headings: 'For beginners', 'For those with some knowledge', and 'For the more advanced', and participants are free to select as broad or as restricted an aspect of this skill as they wish, but appropriate social and cultural aspects are to be covered.

TRANSPORTATION

ASTRONAUTICS

Introduction

Assessment

For assessment, each individual is to produce evidence of regular application to the skill over the required period. This may take the form of a certificate of attendance at instruction classes, a note book, diary or log or other similar means.

At all levels participants should trace the influence space travel has had on man from the earliest time possible.

For beginners:

Award participants should:

- 1 Know what the solar system looks like and the names of all known bodies more than 2000 miles in diameter. Prepare a table giving their names, sizes, details of orbit, rotation, escape velocity and general description of atmosphere and surface features.
- 2 Know why an artificial satellite revolves round a planet and why a planet revolves round the sun.
- 3 Know the influence of speed on a satellite orbit.
- 4 Describe how space satellites have added to our knowledge of the Earth and the Moon.
- 5 Explain how solid and liquid propellant rocket motors work.
- 6 Prepare a summary of all manned space flights giving as many details as possible.
- 7 Keep a record of all artificial satellites and space probes launched during a given period indicating (where possible) launch, date, lifetime, purpose and degree of success, and date of decay or recovery.
- 8 Observe an artificial satellite in the sky.
- 9 Study the early developments of astronautics, e.g. Leonardo da Vinci.

Skill Section

For those with some knowledge:

Award participants should:

- 1 Make a sectional model of a solid propellant rocket motor.
- 2 Make a coloured diagram of a pump-fed liquid propellant rocket motor.
- 3 Draw a diagram of any known three-stage satellite launcher, showing where the tanks, engines, guidance and payload are.
- 4 Write an essay on the launch of a manned satellite.
- 5 Make a list of the things a man must have if he is to survive for 14 days in a capsule, indicating how much of each he wants.
- 6 What space probes will tell us about the Sun and other stars.
- 7 Study the important developments in astronautics in mythology and literature.

For the more advanced:

Award participants should:

- 1 Draw a capsule in which a man might live for 14 days, showing, particularly, the lay out of the life support equipment.
- 2 Draw a diagram showing the shape and position of the radiation belts round the Earth.
- 3 Know what information satellites and sounding rockets have provided about the Earth's upper atmosphere.
- 4 Make a model to demonstrate the orbit of an artificial satellite.
- 5 Try to measure the acceleration due to gravity.
- 6 Describe what he thinks a manned space Station should be like.
- 7 Plot successive orbits of one artificial satellite visible in the period and deduce its height, period and velocity.
- 8 Show an intelligent appreciation of possible future methods of propulsion.
- 9 Explain how simulators are used in astronautics.
- 10 Show how astronautics can assist in studying the origin of life.
- 11 Make a reasonably accurate model of a large rocket in current use, OR Carry out an experiment to show the working of a closed oxygen/carbon dioxide cycle OR Prepare a working model to show the operation of a communication satellite system (torch bulbs may be used to represent radio waves).
- 12 Study the implications of space programmes; the 'Space Race'; government spending of scarce resources versus social expenditure; research developments and benefits arising.



Skill Section