SPACE - THE FINAL FRONTIER

UNIT OVERVIEW

In this unit, students explore the exciting and intriguing world of space. The unit is divided into two main sections. The first, uses lecture style notes combined with interesting assignments and activities to build up an information base. The second centers around four fun activities devoted to space exploration and how a rocket works. Each student receives an **Activity Handbook** that contains related assignments. Students are guaranteed to get a **"blast"** out of this unit.

PART I - SPACE - THE FINAL FRONTIER

- Notes (using overhead) provide a base of information.
- Lesson topics are:
    1) Space, Weightlessness, and Gravity
    2) A Day in the Life of a Star
    3) Galaxies, Constellations
    4) Solar System - The Spydom Model
    5) The Solar System - Planets, Asteroids, Moons and Satellites
    6) Planet Brochure
    7) Planet Song
- Students receive an Activity Handbook that contains assignments and activities related to lesson topics.

PART II - SPACE EXPLORATION and ROCKETS

- Activities include:
    1) Space Menu
    2) Parachute Making Competition
    3) Rocket Boat Competition
    4) Egg Splat Competition
    5) Exam
- Students complete activities and assignments in their booklets as the unit progresses.

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PART I - SPACE - THE FINAL FRONTIER

PART I - Lesson 1 - Space, Weightlessness and Gravity

Student Objectives and Activities

- The class discusses the question "What is it like in space?"
- Students complete an activity that demonstrates weightlessness.
- Students complete overhead notes and answer related questions.
- Students begin colouring the cover of their **Space Handbook**.

Suggested Teaching Strategies

- Introduce the unit by asking students to describe what they think it is like in space.
- Hopefully students will be able to identify some of the characteristics of space - especially weightlessness.
- Once on this topic, simulate the weightlessness of space with the following activity:

  > Stand in a doorway, arms at your sides with palms turned inward. Spread your arms outward until the backs of your hands are pressing against the doorfame. Now push outwards as hard as you can for 40 seconds. Step out of the doorway and slowly raise your hands over your head - they should feel "weightless." (With smaller children, a doorway may be too wide for this activity and the teacher will have to find a narrower space)

- After the weightlessness activity, students begin writing down the notes in their science books, copying from the overhead projector.
- Stress the **emptiness** of space. Stars and planets are not as close together as they appear on "Star Trek". It takes light 4.3 years, travelling at the speed of light, to go from Earth to the nearest star, Alpha Centauri (not including the Sun). The speed of light is about 1 billion kilometers per hour.

PART II - Lesson 2 - Parachute Contest

Student Objectives and Activities

- Groups create parachutes that bring two paperclips gently back to earth.

- Students understand that the purpose of the parachute is to slow the rocket down.

Suggested Teaching Strategies

- This lesson allow groups to develop a parachute in a friendly contest format, very similar to a "Science Olympics" style of activity. (scraps of cloth and string are required for this activity)

- First, help students understand the purpose of the parachute by using examples. These could be pilots and skydivers jumping out of planes or drag racers using parachutes to slow the cars down after the race is over.

- Divide students into pairs or small groups.

- The task of each group is to build a working parachute that will allow the weight of two paperclips to drop the slowest from a height of two meters.

- Each group gets one piece of cloth 20 cm by 20 cm, 1.5 meters of string and 2 paper clips as weight.

- Other objects such as pennies can take the place of the paperclips and grocery bags can be substituted instead of cloth.

- The best parachutes seem to be circular in shape with five evenly spaced guide lines attached to the paperclips, although it is best for the groups to find this out for themselves.

- Drop each parachute from the same height and time them. The **Slowest** one is the winner.

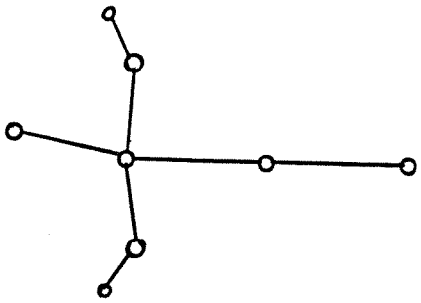
- The first place winner will win a **FREE** trip to Moose Jaw Saskatchewan!

***** Note *****

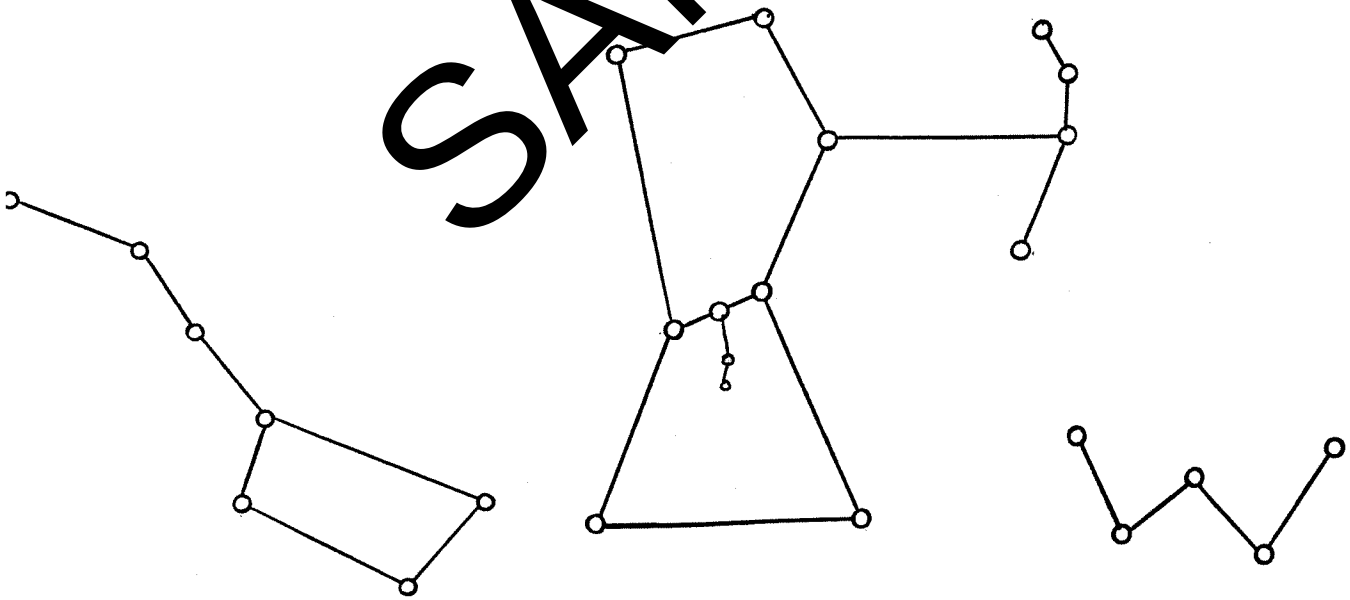
The second place group will receive <u>two</u> free trips.

CONSTELLATIONS

Is this a picture of a swan or a cross?



A constellation is a *pattern* of stars in the sky. Some people thought that the patterns looked like familiar objects on earth so they named them. The constellation above has two names - "Cygnus the Swan" and "The Northern Cross." Note that if a person went to a different part of the galaxy and looked at the same stars, the patterns would look different. Famous constellations include:



Big Dipper **Orion the Hunter** **Cassiopea**

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