



**Prize Winner**

# **Models & Inventions**

## **Year R-2**

**Liam Rathnaweerage**

**St Peter's College**



# RISK ASSESSMENT FORM

## Models & Inventions

This must be included with your report, log book or entry

NAME: Liam Rathnaweerage ID: 0680

SCHOOL: St. Peters College

Activity: Give a brief outline of what you are planning to do.

I am going to make a model of a satellite.  
I will show how people in remote areas can get  
Internet using satellites.

Are there possible risks? Consider the following:

- Chemical Risks: are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal Risks: are you heating things? Could you be burnt?
- Biological Risks: are you working with micro-organisms such as mould and bacteria?
- Sharps Risks: are you cutting things, and is there a risk of injury from sharp objects?
- Electrical Risks: are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation Risks: does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control / manage the risk
Sharps Risks	Use scissors carefully under my parent's guidance. Ask a parent to cut wooden parts using a saw.
chemical Risk	wear gloves when using super sticky glue or ask a parent to help

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Liam Rathnaweerage

SIGNATURE(S): Liam

by ticking this box, I / we state that my / our project adheres to the listed criteria for this Category.

TEACHER'S NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

---

# Model of a Satellite

Liam Rathnaweera - St Peter's College

---



---

## Scientific principle demonstrated

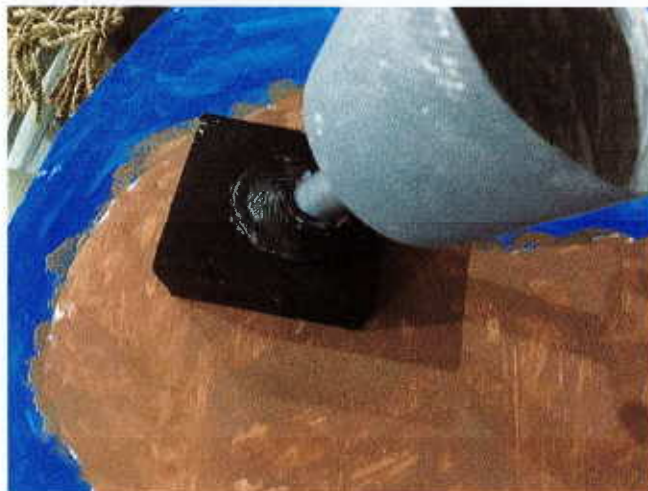
My model shows how satellites can be used to connect with people living in remote areas, like a ship in the ocean. It also shows the most important parts of a satellite.

## How the entry was made

I used a photo of a satellite to learn about it. I made the satellite using cardboards and a cardboard tube. I used lego bricks to build the ship. My dad helped to fix the satellite to the board and fix the torch to the wooden base.

## Problems

I used blue tack to fix the mirror to the satellite, so I can tilt it. But it kept falling down. Then I used super glue to stick it and changed the way I fixed the torch. My dad made a big hole in the wood and we used blue tack to hold the torch. Now we can move the torch instead of the mirror.



---

## How to operate the model

Use the buttons in the torch to create a light beam.



Point the light to the mirror. The mirror reflects the light and shines on the ship.



The torch can create a laser beam as well. Press and hold the first button to do this. Mirror reflects the laser dot towards the ship.



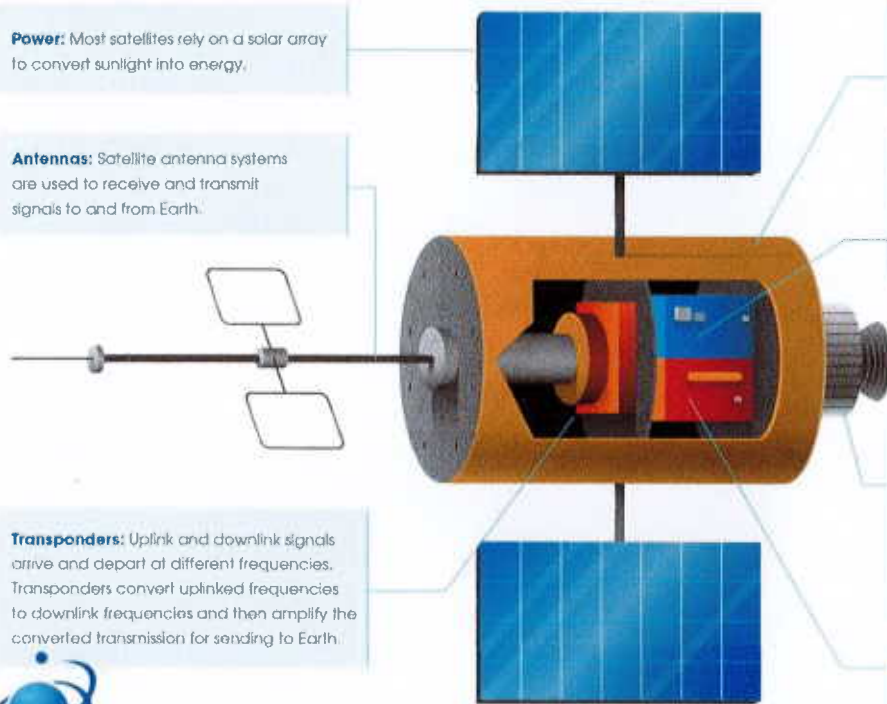
**Power:** Most satellites rely on a solar array to convert sunlight into energy.

**Antennas:** Satellite antenna systems are used to receive and transmit signals to and from Earth.

**Transponders:** Uplink and downlink signals arrive and depart at different frequencies. Transponders convert uplinked frequencies to downlink frequencies and then amplify the converted transmission for sending to Earth.



SPACE FOUNDATION



**Housing:** Housing is constructed from strong materials that can withstand the harsh space environment.

**Command and Data Handling:** The operational heart of a satellite, command and control systems monitor every aspect of the satellite and receive commands from Earth for operation.

**Guidance and Stabilization:** Sensors monitor the satellite's position to ensure it remains in the correct orbit and is oriented toward the correct target. If necessary, thrusters and other maneuvers allow a satellite to fine-tune its position and orientation.

**Thermal Control:** Guards satellite equipment against extreme changes in temperature.

## **Acknowledgement of help - Model of a satellite**

My dad drilled all the holes in the model using an electric drill. He also cut wooden pieces using a saw. He helped to glue satellite parts using super glue.

Liam Rathnaweerage