How to play

Decide what you want to find out and choose the instruments to take accordingly. You cannot take them all so you must make choices to give you a balanced mission. Write down the instruments you want to take and the information this will give.

Once you have the ideal mission, put in a 'bid' for funding for your mission to the Mission Planning Committee, explaining what your mission expects to achieve. You will need to be persuasive and make a reasoned case for your mission. Good luck.

If your plan is accepted, your spacecraft and instruments will need to be built and tested which will involve lots of people from several countries. The Space Science and Technology Department at the CCLRC Rutherford Appleton Laboratory has a large test chamber, vibration table and other test facilities which are used to test spacecraft before launch. Once launched it is not usually possible to repair spacecraft.

Watch the video to see how strong and well-built everything needs to be if it is to survive a launch and the extreme conditions in space.

Choose your instruments from the following list. Think carefully about the mass limit and physical size bearing in mind what you what to find out. Planning missions such as this is always a compromise between mass, size and cost. Every kilogram of payload increases the cost of the launch.

Instruments available for your Mission to Pluto

Maximum mass is 400 kg Maximum area is 1m x 1m

INSTRUMENT	SYMBOL	WHAT IT FINDS OUT ABOUT	AREA	MASS
Support equipment	rucsack	essential as it has the batteries, fuel and computers. Nothing will work without this	0.5 m x 1.0 m	200 kg
Lander (with a camera, a scoop on an extendable arm and an oven with an analyser to heat the rocks)	suitcase	optional but can find out more about the surface and collect samples. The camera will take images of the surface. The scoop can collect samples of the surface which are heated in the oven and any gases given off can be analysed to find out what the rocks are made of	1.0 m x 0.1 m	80 kg
Optical camera	camera	visual images	0.4 m x 0.1 m	10 kg
Ultraviolet camera	camera with a sunhat	gives images in the ultraviolet (UV) region	0.4 m x 0.1 m	10 kg
X-ray camera	camera with an X-ray image	gives X-ray images	0.4 m x 0.1 m	10 kg
Infrared camera	camera in the dark	gives images based on the heat given off	0.4 m x 0.1 m	10 kg
Thermometer	thermometer	measures the temperature	0.4 m x 0.2 m	20 kg
Radiowave probe	radio	gives us information about what is inside the planet	0.5 m x 0.3 m	50 kg
Optical spectrometer	magnifying glass	tells us what elements it is made of	0.4 m x 0.2 m	20 kg
Infrared spectrometer	red magnifying glass	gives us information about what molecules are present	0.4 m x 0.2 m	20 kg
Gas analyser	sniffer dog	which gases are present and how much	0.3 m x 0.3 m	40 kg
Organic material analyser	garden fork	if there are living things present' which and how much	0.3 m x 0.2 m	40 kg
Rock and dust analyser	hammer	looks at any dust present to say what it is and how much	0.3 m x 0.2 m	50 kg
Water detector	umbrella	detects the presence of water	0.3 m x 0.2 m	40 kg
Particle collector (sticky panel)	lizard	collects any particles in the atmosphere	0.5 m x 0.1 m	30 kg
Solar activity monitor	box marked sunspot counter	monitors the changes in the Sun's activity	0.2 m x 0.1 m	10 kg
Solar wind analyser	satellite dish	looks at which particles from the Sun pass by	0.2 m x 0.1 m	10 kg
Magnetic field measurer	compass	measures the strength of the magnetic forces	0.5 m x 0.3 m	80 kg
Gravity field measurer	scales	will measure the gravity	0.5 m x 0.3 m	80 kg