



Expedition Mars Biology (BIO) Team

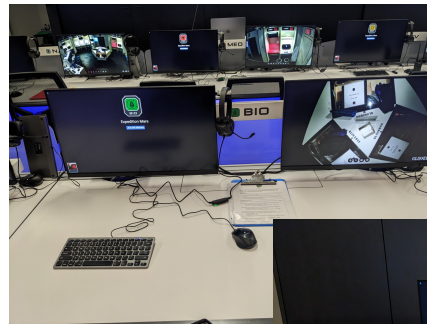


Job Description:

Collecting data about organisms and environmental factors that impact space exploration, testing soil to determine if microbes are present, and swabbing surfaces for signs of bacteria.

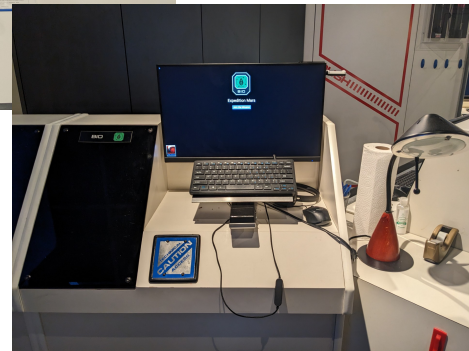
Career Connections:

- Biologist
- Environmental Researcher
- Botanist



Helpful Skills:

- Following procedures
- Observation
- Graphing
- Drawing Conclusions



Vocabulary:

Mission Vocabulary:

Mission Commander – the person who is in charge of the astronauts onboard a space vehicle

Flight Director – the person who supervises a space mission from Mission Control

Simulator – an artificial environment created to resemble an actual place

Task Cards – a step-by-step set of written instructions for performing a job

Orientation – an introduction, as to guide one in adjusting to a new activity

Airlock – a device that permits the passage of people and objects between areas while minimizing the change of pressure and loss of air

Docking – joining with a space station or another spacecraft while in space

Altitude – the vertical elevation of an object above a surface (such as sea level or land) of a planet or natural satellite

Velocity – the speed of something in a given direction

Satellite – an artificial body placed in orbit around the Moon, Earth, or another planet in order to collect information for communication

Orbit – the path followed by an object around another object

Launch – to release, catapult, or send off

Crater – a basin resulting from the collision of an object with a planetary surface

Drone – a remote-controlled pilotless aircraft or small flying device used for many purposes, including surveying the land and transporting materials

Deploy – to bring into action and make useable

Atmosphere – the envelope of gases surrounding the earth or another planet

Asteroid – a large, irregularly shaped rocky object in space that orbits the sun

Ejecta – material or particles that are forced or thrown out of an area after a forceful impact has occurred

Impact – the action of one object coming forcibly into contact with another

Radiation – a form of energy that is emitted in the form of rays, electromagnetic waves, and/or particles; space radiation can cause health problems in astronauts who are exposed

Greenhouse – a structure enclosed and used for the cultivation of or protection of plants

Touchdown – the moment at which a part of a spacecraft makes contact with the ground during landing

Troubleshoot – to identify, plan, and resolve a problem

Vocabulary for My Job:

Microbe – a living thing that is small or microscopic, such as bacteria or fungi

Cultures – cells or tissue grown in a material containing nutrients

Bacteria – singular, one-celled organisms with cell walls

Beneficial – producing good or helpful effects



Expedition Mars Robotics (BOT) Team



Job Description:

Programming the ROV (Remotely Operated Vehicle), testing the capabilities of a robotic arm, and identifying potential dig sites on the Martian surface.

Career Connections:

- Mechanical Engineer
- Software Engineer

Helpful Skills:

- Spatial awareness
- Computational thinking
- Communication



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Vocabulary for My Job:

Programming – providing instructions to a computer to perform a set of actions without direct human control

Mass – the quantity of matter contained in an object

Coordinates – a group of numbers used to indicate the position of a point

Robotic Arm – a mechanical, programmable machine that can perform tasks similar to a human arm, such as grasping and placing objects

Elevation – height above sea level



Expedition Mars Geology (GEO) Team



Job Description:

Conducting tests on Martian rocks and minerals, recording and analyzing observations, and mapping possible dig sites on the Martian surface.

Career Connections:

- Geologist
- Environmental Engineer

Helpful Skills:

- Observation
- Hand-eye coordination
- Patience
- Following procedures



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Vocabulary for My Job:

Vein – a line formed on a rock when water passes over it; can show that at one point the rock was exposed to water

Porous – description of a rock that has a lot of small holes in it

Mineral – a solid inorganic natural substance

RAT – Rock Abrasion Tool; used to remove the surface layer to view the minerals below it



Expedition Mars Life Support (LS) Team



Job Description:

Maintaining the life support systems on the spacecraft by monitoring air and water quality and responding quickly to issues to ensure safe conditions for all members aboard the spacecraft.

Career Connections:

- Industrial or systems engineer
- Chemist

Helpful Skills:

- Reading gauges
- Following procedures
- Remaining calm under pressure
- Observation



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Vocabulary for My Job:

Thermostat – the controls used to regulate a heating system

Air Pressure – the pressure exerted by the weight of air on the earth's surface

Configuration – the arrangement of different parts or components in a particular form or combination

Air Filter – a device for filtering particles of dust, smoke, pollen, mold, viruses, etc. from the air

TDS – total dissolved solids; a measure of anything dissolved in water that is not an H₂O molecule

Humidity – the amount of water vapor in the air

Desiccant – a substance used to absorb moisture, used when the air is too humid

pH – a scale used to specify the acidity or basicity of a liquid



Expedition Mars Medical (MED) Team



Job Description:

Conducting medical tests on and developing treatment plans on the crew to ensure their health and safety.

Career Connections:

- Nurse or doctor
- Emergency Medical Technician (EMT)
- Nutritionist

Helpful Skills:

- Interacting with others
- Patience

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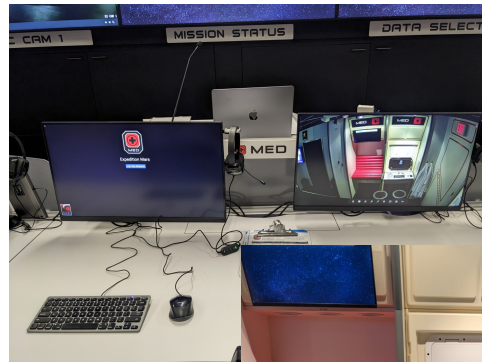
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Vocabulary for My Job:

Nutrients – substances that promote growth, provide energy, and maintain life

Nutrition – obtaining the substances necessary for growth and good health

Treatment – something that healthcare providers do for their patients to control a health problem, lessen its symptoms, or clear it up

Wellness – the optimal state of health

Deficiency – a lack or shortage of something

Calories – units of energy, often used to express the nutritional value of foods

Microgravity – the condition in which people or objects appear to be weightless



Expedition Mars Navigation (NAV) Team



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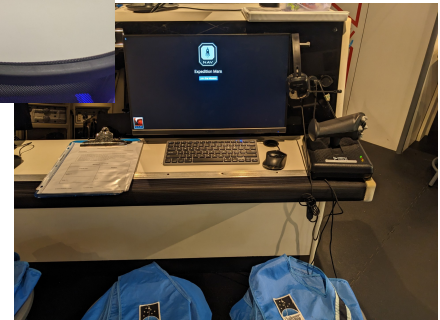
Calculating fuel levels and plotting the course for the spacecraft, performing critical pre-flight checks, and navigating the spacecraft between Phobos and Mars.

Career Connections:

- Pilot
- Aerospace Engineer
- Mathematician

Helpful Skills:

- Completing multi-step math problems
- Communication
- Collaboration



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Vocabulary for My Job:

Descent – an action of moving downward, dropping, or falling

Liquid Fuel – the substance that burns to create the expanding gases that power a rocket engine

Oxidizer – a source of oxygen necessary in the vacuum of space, where there is no oxygen to help ignite the fuel

Aerobraking – a spaceflight technique wherein an orbiting spacecraft brushes against the top of a planetary atmosphere; this process slows down the spacecraft

Orbital Period – the time it takes the spacecraft to complete one orbit

Thrust – the force that propels a rocket forward, allowing it to overcome gravity and atmospheric drag to reach orbit



Expedition Mars Communications (COM) Team



Job Description:

Communicating messages between the Spacecraft and Mission Control, communicating critical messages to crew members, and locating and reprogramming communication satellites.

Career Connections:

- Communication Engineer
- Information Technologist

Helpful Skills:

- Reading aloud
- Keeping calm under pressure
- Multi-tasking
- Leadership



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Vocabulary for My Job:

Frequency – the number of waves that pass a fixed place in a given amount of time

Quadrant – each of four parts of a surface, divided by two intersecting lines



Expedition Mars Rover (ROV) Team



Job Description:

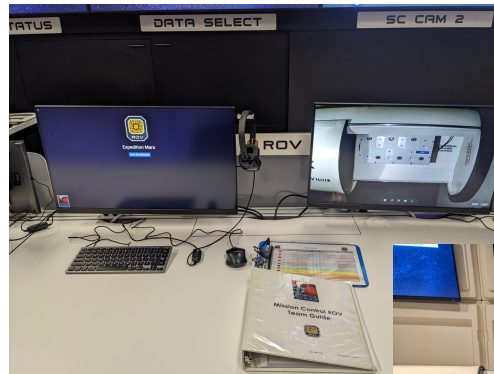
Collaborating with teammates to build, test, and troubleshoot the remotely operated vehicle (ROV); and installing critical components and retrieving data.

Career Connections:

- Computer Scientist
- Mechanical Engineer
- Electrical Engineer

Helpful Skills:

- Following directions
- Collaboration
- Communication
- Completing basic math calculations
- Remaining calm under pressure



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Vocabulary for My Job:

Payload – the object or the entity that is being carried by a vehicle

Bus – the ROV body that holds the core

Assemble – put together

Power – a source or means of supplying electrical energy

Mass – the quantity of matter contained in an object



Expedition Mars Weather (WX) Team



Job Description:

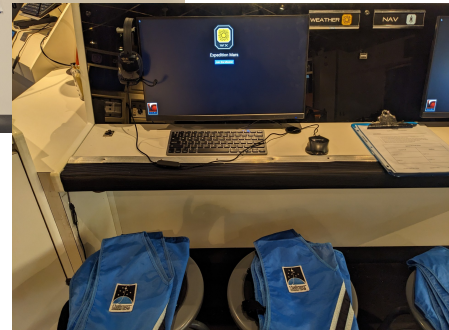
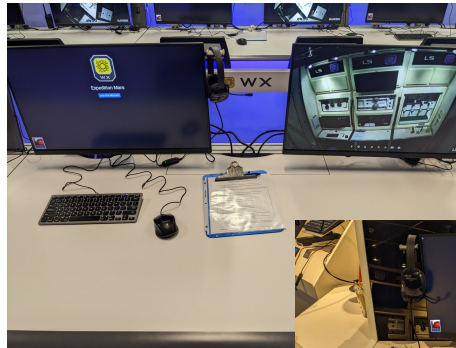
Researching and learning about celestial objects, monitoring the Martian sky, tracking objects, and calculating trajectories; and tracking and observing dust storms on the Martian surface.

Career Connections:

- Meteorologist
- Astronomer

Helpful Skills:

- Map reading and plotting
- Completing basic math calculations
- Following directions
- Analyzing data



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Vocabulary for My Job:

Starfield – any set of stars visible in a field view of a telescope, usually in the context of some region of interest

Trajectory – the path followed by an object moving through space

Current – the measure of the amount of flow of electrical charge

Power – a source or means of supplying electrical energy