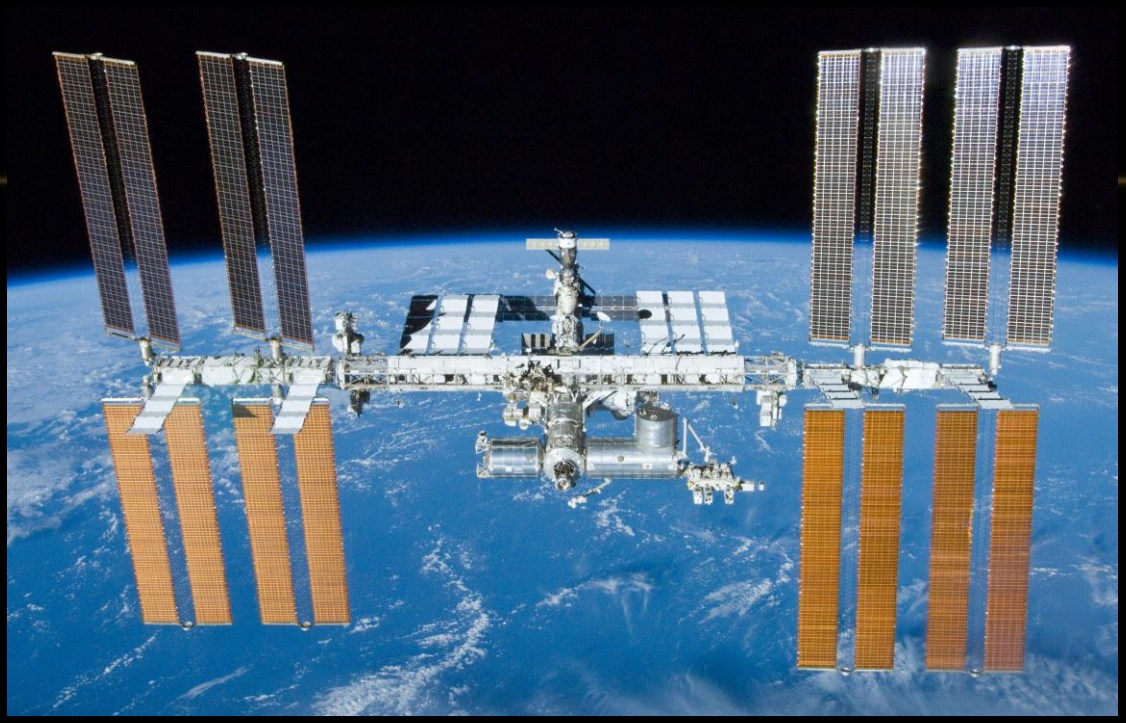
INTERNATIONAL SPACE STATION



WHAT IS THE ISS?

- The International Space Station is a special kind of spacecraft in orbit around the Earth.
- It is a large research facility with people on-board who run science experiments that can only be done in space.
- The three main reasons for the International Space Station are scientific research, exploration, as well as educational and cultural outreach.
- http://www.nasa.gov Space to Ground: Happy Anniversary

HOW DOES IT MOVE?

- The ISS does not need engines, it is falling around the Earth! But it needs to be able to orient and “steer” itself in space.
- The ISS orbits the Earth and flies through space at around 27,000 kilometers per hour. This means the ISS goes around the Earth approximately once every ninety minutes!

WHAT DOES THE ISS DO?

- Experiments with space medicine, gravity's affect on life, future space travel, biology in space, discovery of new materials, and various technology experiments. They also observe and study the Earth and space.

FUTURE SPACE TRAVEL

- A journey to Mars would take about 30 months, can the human body do it?
- Zero gravity affects the muscles and bones in humans and studying these effects in space can help us better understand how the body works and is useful information for future space travel.
- https://www.youtube.com/watch?v=Wam7poPzG1w
- http://www.nasa.gov
- ScienceCasts: The “Omics” of Space Travel
- ScienceCasts: Space Vision

PROPERTIES OF ‘STUFF’ IN SPACE

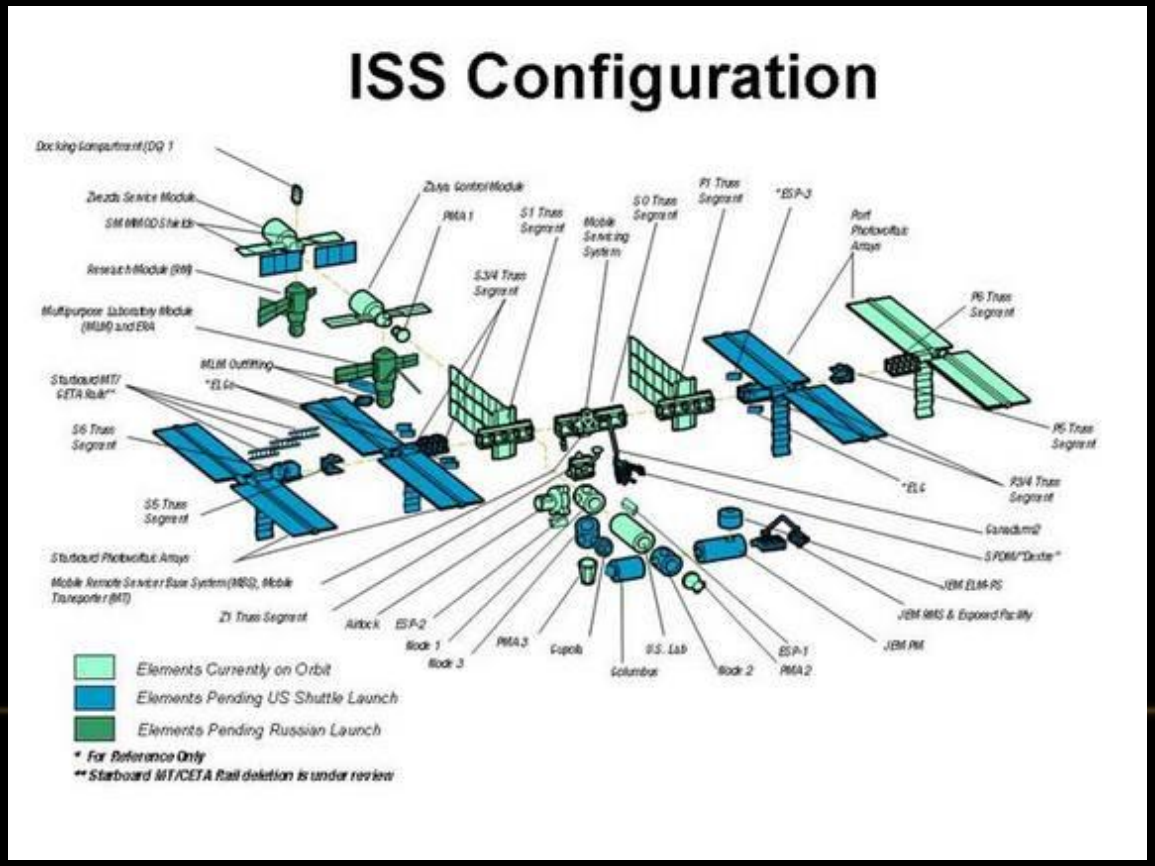
- Studying materials in space is also useful, like fluids, flames, metals, and studying all kinds of different objects and materials in space helps us gain a better understanding of all these things on Earth.
- http://www.nasa.gov
- Space to Ground: Tanks Up

EARTH MONITORING

- The ISS offers a great window to watch the Earth, watching weather, climate, agriculture trends, natural disasters, pollution, deforestation, etc. From our viewpoint up there, we can find ways to predict weather more effectively, see where to clean up pollution and oil spills, and find lots of ways to improve our life on Earth.
- From the ISS, we can have a more clear view of all the galaxies out in the universe and we can even study the nature of space itself.
- http://www.nasa.gov Benefits for Humanity: A Snapshot

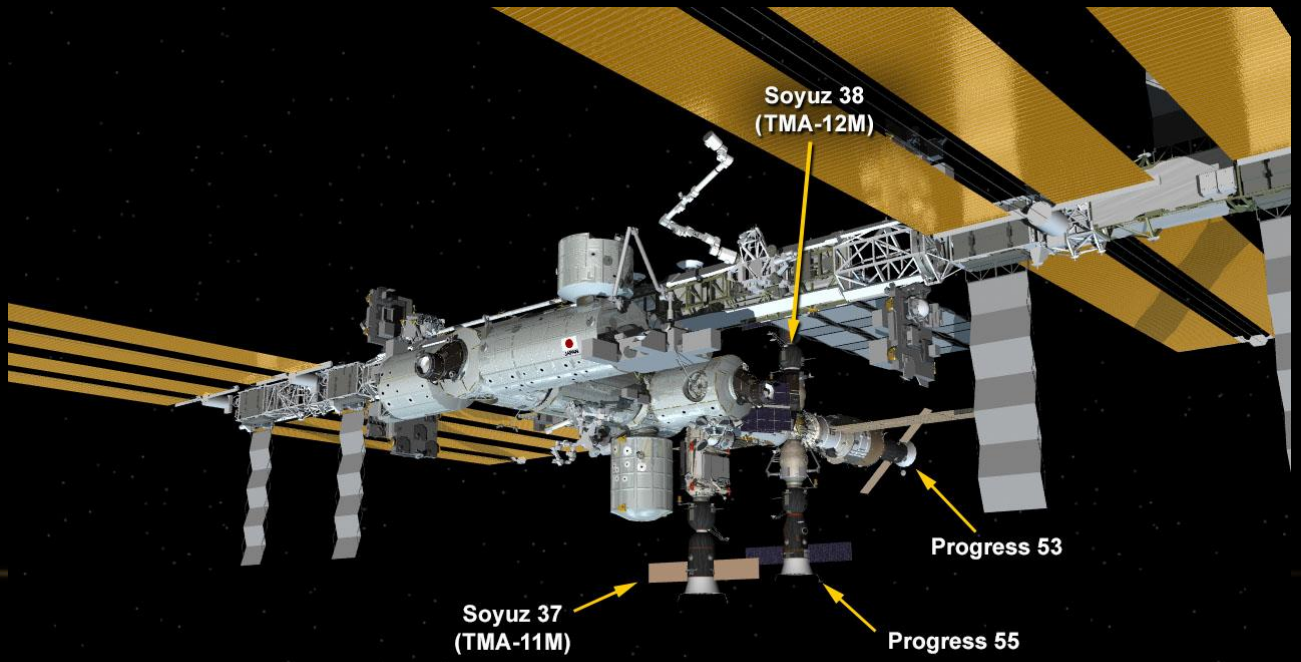
HOW WAS THE ISS BUILT?

- The ISS was begun in 1998 and has been fully completed. Over time, the US space shuttle and Russian rockets were primarily used to get materials, parts, and people back and forth from the Earth up to the space station.



WHAT ARE THE PARTS?

- Solar panels are used to gather energy from the sun and used as power all over the ship. The long tube-like structure in the middle is a combination of different segments that can rotate the solar panels and control other systems. The full length of the ISS is more than the length of a football field.
- There is a docking compartment for space vehicles.



WHAT ARE THE PARTS?

- There is a habitation module where the astronauts eat food, shower, and sleep.
- There are laboratory modules designed for scientific experiments. Some of these experiments are even done during spacewalks, where astronauts move around the outside of the space station.
- https://www.youtube.com/watch?v=Y1JRW1wu1Fw

WHO IS ON THE ISS?

- The ISS supports a full-time crew of up to six people.
- Once a person is inside the International Space Station, they can float around without needing a space suit. The only time an astronaut would need a spacesuit is if they are doing a spacewalk.
- There are life support systems on the ISS which provide oxygen and remove carbon dioxide so astronauts can do their job onboard and breath normally. Much of this oxygen comes from a process where the electricity from the ISS solar panels is used to split water into hydrogen and oxygen gas

WHO IS ON THE ISS?

- American Commander Scott Kelly has recently broken two records, most days lived in space and longest continuous time spent in space!!

FOOD IN SPACE

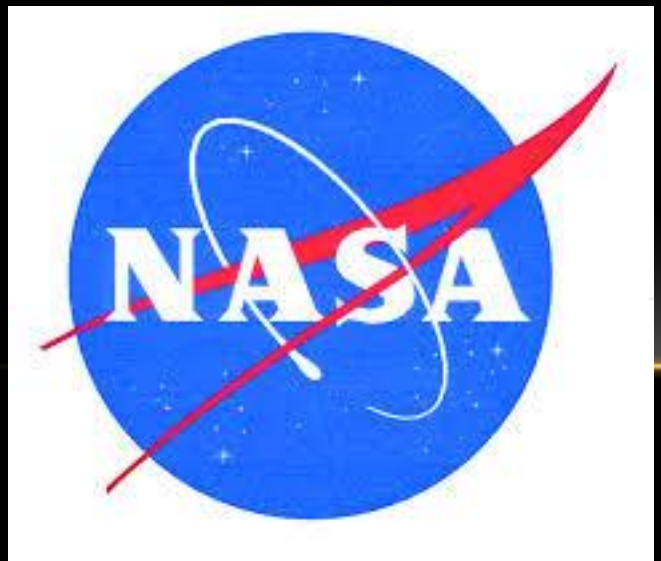
- On the ISS, meals often come in a meal tray, and the meal tray becomes a sort of dinner plate with several foods to choose from. The tray holds the foods down so they don't float away. Much of the food can be scooped up with a spoon for eating. The food and drink come in cans or dehydrated so things don't have to be refrigerated. If the food isn't strapped to the table, you can just grab it out of the floating air around you.
- https://www.youtube.com/watch?v=AZx0RIV0wss

SLEEPING IN SPACE

- Astronauts are weightless and can sleep in any orientation. However, they have to attach themselves to a wall, seat, or bed so they don't float around and bump into something.
- http://www.nasa.gov Space to Ground: Station Sleep
- https://www.youtube.com/watch?v=UyFYgeE32f0

WHO IS IN CHARGE?

- The two primary countries involved with the ISS are the United States with NASA and Russia with the RSA. Other countries involved with the construction and ongoing activities on the ISS are the Canadian Space Agency, the European Space Agency, Japan, Brazil, and many others.
- The International Space Station had to be constructed in space, piece by piece. Many of the components put together were so heavy that the only way to assemble them was in the weightlessness of space. The first part of the ISS was called Zarya, built by Russia, and was sent and constructed in 1998. The second part was called Unity, built by the US, and both modules were connected together in space.



WHO IS IN CHARGE?

- NASA flight control operations maintain oversight and approve all plans while the Russian flight control team direct real-time ISS operations based on approved plans. Most of the other modules of the ISS are either US or Russian, but plenty other modules belong to those other countries around the world. For example, the Kibo Japanese Experiment Module performs space medicine experiments, communications research and is operated by Japan.

YOUR ASSIGNMENT…

- http://www.nasa.gov/mission_pages/station/research/experiments_category/index
- Choose an experiment being done on the ISS and create a short presentation for the class. You may work in groups of 2 or 3 – but no more!