

ISS Activity #4

What you need for this activity:

- Access to the internet
- Scratch paper, drawing paper or card

Topic: School/student experiments on the ISS

The ISS is a huge, orbiting laboratory. As well as research into how humans can survive in space and how to prepare for long-distance space missions, the ISS hosts a wide range of science and technology experiments. Companies, Universities and Schools can apply to NASA to put an experiment on the Space Station.

The experiments usually spend a fixed amount of time on the ISS and they may even be returned to Earth for further research. The ISS has data collection and communication capabilities to monitor experiments and convey the data to Earth for scientists and researchers to work with that data.

In some ways, it's just like conducting an experiment in your school lab, except that it's conducted in microgravity and you can't actually touch it! The good news is that the astronauts are trained to install and run the experiments – it's an important part of their job.

Experiments in general

Read the article below about 12 cool experiments on the ISS. Which one is your favorite?

<http://mentalfloss.com/article/59639/12-cool-experiments-done-international-space-station>

One experiment that you're connected to through your ISS-ABOVE is the HDEV (High-Definition Earth Viewing experiment). These are the four commercial cameras (you could buy them in a store or online) that are fixed to the underside of the ISS and provide the video of the Earth that you see on your ISS-ABOVE. The 'experiment' was designed to test the cameras to see if they could stand up to cosmic radiation. They launched in 2015, so they're doing pretty well.

Worksheet

Design your experiment

On a typical resupply vehicle, there will be some experiments going to the ISS. In the article below, see if you can find the two experiments designed by school students:

<https://www.wired.com/story/iss-resupply-saturday-science/>

Here's the technical description of one of those experiments:

https://www.nasa.gov/mission_pages/station/research/experiments/2717.html

For students to get an experiment to the ISS, they have to go through the same application process as anyone else. This is as close as doing 'real' science as you can get – competing for space on the ISS with commercial companies.

A number of experiments come from Middle Schools!

Activity: What experiment would you send to the ISS if you could?

Remember that it's important that there's a good reason why you would want to run the experiment in microgravity.

For example, a number of experiments look at how well plants grow in space. Why might this be important?

Brainstorm some ideas for an experiment on your scratch/drawing paper.

1. What would the experiment be designed to find out?
2. What would you need to send to the ISS?
3. How would you measure the results of your experiment? Do you need hourly or daily measurement, or just at the end of the experiment?
4. Does the experiment need to come back to Earth? (If not, it will be placed in a returning resupply vehicle with trash, which burns up completely on re-entry.)
5. Draw a diagram of your experiment. Don't forget that experiments on the ISS are always contained in a sealed box.