

Setting up an experiment in space

What modifications need to be made?

It's difficult to prepare for the unexpected, so the first challenge is to make sure your experiment is as robust as possible – once you are in orbit there won't be a lot of chance to tinker. Another major factor is mass. On Earth, sometimes experiments can fill an entire room. For space missions, 'elbow room' and mass are at a premium, so you need to work to miniaturise your equipment as much as possible.

Even routine procedures like taking blood samples, urine collections and body weight checks require a lot of thought. And remember, if your experiment needs human input then it will have to be operated by the astronauts aboard, who may not be experts in the field.

Depending on your experiment, it may be useful to have an identical control experiment on the ground. Say, for instance, that you want to investigate the effects of microgravity on plant growth. As always in science, you want every other variable to remain constant, and only the one you want to test is changed. Having a second experiment on the ground with all the same conditions, but with the addition of gravity, gives you a control. (Do also think about how many repeat experiments you might need – larger sets of data increase reliability.)

You could be waiting quite a long time for your experiment to return to Earth, as resupply missions to the International Space Station don't run all that often. Instead, you might want to think about ways your experiment can generate digital results that can be sent as messages back to Earth while your experiment is still in orbit.

QUESTIONS FOR DISCUSSION

What types of experiments do you think translate most easily to space? Which experiments are more difficult?

REFERENCES

[UN Office for Outer Space Affairs: Teacher's guide to plant experiments in microgravity \[PDF\]](#)

ABOUT THIS RESOURCE

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