

# SPACEX CREW-3

## MISSION FOR SCIENCE



1  
00:00:00,367 --> 00:00:03,203

One of the sort of wise  
mantras in our office

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00:00:03,203 --> 00:00:06,339

is there's nothing more important  
than the thing you're doing right now.

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00:00:06,573 --> 00:00:09,542

And I think that's especially true  
when we're aboard the space station

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00:00:09,542 --> 00:00:13,313

and have the opportunity to perform  
some incredible experiments

5  
00:00:13,313 --> 00:00:16,616

on behalf of some amazing  
principal investigators on the ground.

6  
00:00:19,285 --> 00:00:21,755

This is the Human  
Research Facility rack.

7  
00:00:23,223 --> 00:00:25,892

What's set up here is a whole bunch  
of equipment for taking blood

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00:00:27,260 --> 00:00:30,430

Basically you put the needle in  
and then the tube here.

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00:00:30,430 --> 00:00:33,299

And you connect other sample tubes too  
to draw blood for

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00:00:33,299 --> 00:00:36,369

whatever research they have going  
on that needs blood samples.

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00:00:37,303 --> 00:00:39,205

We're actually executing over

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00:00:39,205 --> 00:00:42,842

350 experiments during our six months up here on the space station.

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00:00:42,842 --> 00:00:46,112

And right now it's science season. We have so much going on.

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00:00:46,413 --> 00:00:48,915

We're always doing experiments on our own bodies.

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00:00:48,915 --> 00:00:50,283

We're trying to understand

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00:00:50,283 --> 00:00:54,187

how the human body responds to the spaceflight environment from radiation

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00:00:54,187 --> 00:00:56,756

being in an apparent microgravity environment.

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00:00:56,756 --> 00:00:59,092

All of those things but we're also doing a lot of cool

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00:00:59,092 --> 00:01:01,327

technology demonstrations to try to understand

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00:01:01,327 --> 00:01:04,030

how to make our time up here and on future missions more efficient.

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00:01:05,899 --> 00:01:07,934

I just last week was working on this combustion chamber.

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00:01:07,934 --> 00:01:09,969

It's actually a big chamber

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00:01:09,969 --> 00:01:13,039

that's where we can start fires with a lot of cameras and sensors

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00:01:13,039 --> 00:01:16,943

to totally understand how fire forms in zero g.

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00:01:17,277 --> 00:01:18,812

And that's pretty important for understanding

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00:01:18,812 --> 00:01:21,147

how fires propagate on the ground as well.

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00:01:22,649 --> 00:01:26,052

So what we're doing is modifying the Materials Science Lab.

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00:01:26,052 --> 00:01:29,989

Which is a very nice furnace that we have here on the space station

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00:01:29,989 --> 00:01:36,029

that allows us to go from a rapid cooling rate to now a furnace that

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00:01:36,029 --> 00:01:39,332

goes especially for a very, very slow cooling rate.

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00:01:39,332 --> 00:01:44,170

And that allows us to do a completely different set of experiments.

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00:01:45,505 --> 00:01:47,407

We're doing a whole bunch  
of plant research right now.

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00:01:47,407 --> 00:01:51,344

So there's actually three active plant  
experiments going on all simultaneously.

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00:01:51,511 --> 00:01:55,915

One's looking at cotton genes  
and basically different strains of cotton

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00:01:55,915 --> 00:01:57,317

to make it more drought resistant

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00:01:57,317 --> 00:01:59,552

and it's kind of like stem-cell research,  
except for cotton.

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00:02:00,019 --> 00:02:00,820

Another one is looking

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00:02:00,820 --> 00:02:04,624

at different ways to water a plant,  
and then another one is looking at

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00:02:05,125 --> 00:02:07,861

we have what's called a Multi Variable-g Platform.

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00:02:07,927 --> 00:02:10,163

Our genes change,  
but also plant genes change.

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00:02:10,163 --> 00:02:12,932

And we're looking at how that changes  
in different environments.

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00:02:13,900 --> 00:02:14,167

All right.

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00:02:14,167 --> 00:02:17,203

So today, Kayla is harvesting some of the

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00:02:18,471 --> 00:02:21,875

cotton plant cell cultures.

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00:02:23,243 --> 00:02:25,879

Just a few weeks ago,  
you installed this fancy device,

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00:02:25,879 --> 00:02:29,249

which is right behind me,  
which is an electron microscope.

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00:02:29,249 --> 00:02:32,352

And for me as a material scientist,  
an electron

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00:02:32,352 --> 00:02:35,288

microscope,  
it's a giant leap on the space station.

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00:02:35,622 --> 00:02:39,058

For the first time, we have a microscope  
that allows us to look

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00:02:39,058 --> 00:02:42,061

really into the tiny details.

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00:02:42,061 --> 00:02:44,063

We get to see the sunrise and sunset

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00:02:44,063 --> 00:02:47,133

16 times a day  
as we're orbiting every 90 minutes.

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00:02:47,267 --> 00:02:49,903

And you can see actually  
see the layers of the atmosphere.

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00:02:50,003 --> 00:02:54,340  
And it reminds us that everything we know,  
live, love, breathe is in that really,

55  
00:02:54,340 --> 00:02:55,775  
really a thin layer.

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00:02:55,775 --> 00:02:58,244  
So we really have to take care of it.

57  
00:03:00,346 --> 00:03:02,815  
It's an incredibly fulfilling experience.

58  
00:03:02,815 --> 00:03:04,584  
To be a part of such a mission-driven

59  
00:03:04,584 --> 00:03:08,221  
organization who is accomplishing  
so much every single day.

60  
00:03:08,488 --> 00:03:11,524  
And when I look back on the things  
that we've had the honor and privilege

61  
00:03:11,524 --> 00:03:13,693  
to be a part of over the last five months,

62  
00:03:13,693 --> 00:03:16,029  
it gives me goosebumps  
every time I think about it.

63  
00:03:16,262 --> 00:03:18,464  
And this crew is just really special.