station this is ISA attack how do you hear me elastic this is the International Space Station welcome before thank you Paul oh you are now connected with the students in Toulouse cologne frascati and Lisbon please begin the greenhouse events humility good afternoon everybody but in fact Iceland Oh Joel avanza Bonjour Natalya what are they oppose gala welcome on board of this special space station for the EPO greenhouse experiment that involves us here in space but I'll see you down there because you guys are going to help
us today in trying to figure out something about going in space going exploring continue our exploration we're going to do together something to verify that if we can actually put plants in space to grow things that we can eat and important to have them germinate have seats and try to reseat them again this is something that not here yet and we want to see how this the microgravity environment radiation environment in different environments advance to this plant so we have here a mini greenhouse it's already set up your inner in a
corner but we will now get a work and

make sure that the greenhouse the

experiment starts so I'm going to start

by putting on some gloves because we

don't want to contaminate the plan to

know then to contaminate hands here in

space you on the ground when you will do

your experiment you will not need to do

this and then go work together we'll put

some water into the the chamber and

initiate the bro

okay this is the setup that we have here

we have a meaning chamber containing the

a growth medium which is a big term for


some sand with some nutrients for plants

we have a bellow it contains the plan so the plan can be isolated and if the plants will lose something it doesn't

float around here in space as you see everything flows so you really need to be careful otherwise you lose everything

attached to this growth chamber we have a syringe and a little reservoir with water what what I'm going to do now I'm going to take it measure Quon your water is specified quantity of water from the reservoir put it into the syringe and then with this syringe put the water into the growth medium I want to think
about is being immediately there's the total amount that will put there is going to be about two hundred ten milliliters and you will do the same so as you see it growing a plant something simple but but we're not fighting is complicated by doing all these measurements but we we are trying to make out of this little thing is scientific experiments and you can do a lot of things a lot of observation you can help us if you really look at what you're doing and make sure that you understand what you do and you do it
carefully so let's go ahead and put some water in here

and now carefully I'm pushing the water into the growth chamber we don't want to go too fast because the water may spill or a mate blood Kim but we want to make sure that we put enough force to get the water in there but slowly so that the growth pinion medium the the earth the dirt that is inside the I get wet over genius lee without creating a spot and here we are we're avada half of it and

time but i'm gonna be done here I will wait a minute let the water band inside
but then we will actually bring the excess water if there is any just to make sure that we don't leave water inside and floating around this impose especially here in space some move some grooves something inside it we don't want so we will drain the excess of one here we go I'm now complete with the 15 millimeters I'm going to remove the clean water supply water reservoir and put a waste water back on it and then drain the chamber as you can see a little bit of water came out not too much which means that
over the water has been hold this vast

majority of the water has been absorbed

by the growth medium medium we also have

a measure of a month on my workers given

there and this is also important that

you know so at this point we can

disconnect is a system for a watering we

will be watering frequently in order to

maintain the roof wet and I never will

actually remove and prepare the upper

part to let a planter lately space for

the plane to grow

so inside the chamber we have seven

plots which correspond to the areas

where their seeds have been planted I'm
going to remove those flags bugs in
order to leave the space for the plants
grow very good
like revine remove the pizza now free to
grow we will close the chamber and put it up our corner in our little corners
of us set up where there is a light we have a control temper temperature
environment so we make sure that there is enough light a good temperature
enough water for the plans to grow and we will initiate our measurements the same way you will do on earth and then
we will compare I was a pictures video

and you will do the same and it will

post them and compare our observations

as you can see in our corner there we

have two chambers one has a feed of like

this and the other one the one we just

initiated now contains arabidopsis which

is a plan that has been has a very non

known very used in biology so here is

general build up so we can actually

know what is doing and is very well

known very used in biology so here is

our setup and and so we can declare the

experiment initiated I'm looking forward

the plants grow maybe we'll eat some
solid here we have some fresh food here

in station it's not going to be enough

for us to actually eat and survive on

that but for the future generation for

the future I start going to Mars going

even beyond that this will be a very

important but also the other day we're

doing a very important step and we also

have in fact let's go ahead with your

questions and then NC hello your

question please hello my name is noise I

have occasion how is the oxygen

regenerated in the space station are you

so Bonjour the oxygen on the space

station is generated by breaking down
water we actually have water and
specially wastewater we have a special
equipment here that breaks it down and
discharge we discharge be nitrogen but
we keep the oxygen and we breathe it in
this way we have a very interesting
system your station via because we have
recycle everything we cannot do a very
stuff or at least we try to throw away
the absolutely minimum and oxygen is one
of the resources that we need to
maintain and be careful on how to use
come on your question please and I'm
like my mascara and my question is how
does the water I get to the plans in the

fact of microgravity a therapy the water

out of water the water gets the plan

well the water is distributed inside

this grows a medium and and I get so

Virginia distributed in India let's

actually have roots and the roots fix

the water so it is actually the plate

looking for the walk and more than the

water looking for the plant and this is

also one aspect that we are actually

looking into it verifying if the fact

that there is no more graphic how

there's this fact changes the way the
186
00:12:51,259 --> 00:12:57,699
route goes down on the growth medium and

187
00:12:54,078 --> 00:12:57,698
actually looking for water

188
00:13:02,159 --> 00:13:13,189
or Scotty your question me hello my name

189
00:13:08,940 --> 00:13:17,009
is Freya and my question is what a

190
00:13:13,190 --> 00:13:21,480
half-century still serves the truth is

191
00:13:17,009 --> 00:13:28,139
emitted doing this the external activity

192
00:13:21,480 --> 00:13:38,009
from D at ISS and how much time have you

193
00:13:28,139 --> 00:13:40,049
got to return safely on board see what

194
00:13:38,009 --> 00:13:42,300
we really really make sure that

195
00:13:40,049 --> 00:13:45,359
everything outside the station doesn't

196
00:13:42,299 --> 00:13:48,269
have any any surface or any anything

197
00:13:45,360 --> 00:13:50,550
they could cut bhutto code or provide or

198
00:13:48,269 --> 00:13:53,250
give us put us in danger so this is very

199
00:13:50,549 --> 00:13:55,258
well carefully checked and make sure
that this doesn't happen but it is this

what happened it depends of the size of

the hole and how much air will actually

escaped from the suit we have a special

container pressurized tank in our be a

spacewalk pursuit and in case of an

emergency this tank is actually

activated and can provide us for about

30 minutes of additional air to

pressurize our suit and this should be

ever for us rush back here look close

the airlock and pressurize it again and

be safe

Lisbon your question please hello my
name is female and my question is how
many times where day and night and now
it will be a little bit on the space
station a very interesting question
because we use the title of the Sun and
the ninth day and night to to actually
get ourself and actually set our work in
the in our rest time well here are
station we are orbiting around the earth
at 28,000 kilometers per hour that's
about seven kilometers per second and
which means that every hour and a half
we actually go around the earth and and
we are for about I would say 45 minutes
50 minutes to an hour on the Sun side
but a half an hour more or less in the other side of the earth so which means we have shielded from the Sun so at the end if you really counted with you we have 16 sunset and 16 sunrises birthday which confuses us and but of course we are not looking outside the window all the time they're actually checking our watch we use the greenwich mean time which is the time of london universal time and we go by that and we make sure that we don't look outside the window if we if we want to know if it's time to sleep or not but we check our watch
to lose we have time for another

question your second question please hi

my name is Jenny and my question is how do you communicate with your loved ones from the ISS yes that's that's obviously it's very important for us to be in touch from the ground and first we will talk to our mission control center and make sure that we get all the work and they follow us what we are doing and but they can also have a little bit of time off and make sure we talk to our families friends we do have ye on board the possibility of using the what is
called an IP phone which is a kind of internet phone we can actually talk when the subtle is available when the link is available will I can actually call essentially any phone on earth also periodically about once a week we have a 10 minutes 15 minutes a slot in which a video conference is set up and we can actually talk to our families I talked to my wife Sasha into my daughter Sophia and it's very nice damn talk dammit and make sure that they don't feel too far away we have time for one last question
cologne your second question please

272
00:17:32,470 --> 00:17:42,740
hello my name is Patrick and my question

273
00:17:35,089 --> 00:17:47,109
is how do you bro wat on the ISS I'm

274
00:17:42,740 --> 00:17:47,109
sorry I missed it the city again please

275
00:17:52,069 --> 00:18:02,009
my name is Patrick in my question is how

276
00:17:54,869 --> 00:18:05,099
do you put water on the ISS understand

277
00:18:02,009 --> 00:18:07,529
correctly how do you pour what yes well

278
00:18:05,099 --> 00:18:09,569
obviously here in the instance you

279
00:18:07,529 --> 00:18:12,539
cannot pour water because what it

280
00:18:09,569 --> 00:18:15,659
doesn't go down we have this drinks bag

281
00:18:12,539 --> 00:18:17,549
that I like our up so they are

282
00:18:15,660 --> 00:18:20,340
completely closed the water is inside

283
00:18:17,549 --> 00:18:22,829
they have a special strong word a and

284
00:18:20,339 --> 00:18:26,359
over at app in there because we need to

285
00:18:22,829 --> 00:18:29,789
close it the freedom would not close the
attack this is what happens which means

what is going all over the place and of course we don't want it to go anywhere

with a way to go into the pavement into the equipment and therefore we keep it contained all the time it's very interesting and it's fun play once in a while hello ether Aztec we here we're near the end of our time we would like to thank you so much for the greenhouse demonstration today and for taking our questions if you would say goodbye to the audience we'd like to say goodbye to you thank you everybody for being up
here in space with me and my other
fellow Australian comport on
international space station i'm pretty
sure that you and you will grow up will
have possibility to growing space space
probably continued exploration will
continue thank you for helping us in
following this experiment doing your
observations compare them with us and
help us help all of us in understanding
better work that happens so thank you to
everybody thank you thank you to
everybody for your participation here
and you're looking forward deal on on
the internet and see when I come back we

will do another of this section and

ciao

station and this is used in ACR that

concludes the event thank you and thank

you Eva's tech station were now since

the station thank you appreciate it you

bet Paolo and we're resuming operational

column now