hey well welcome into Mission Control

Houston victory lakes Intermediate

School you're joining me again Mission Control Houston where we're controlling all the systems onboard the International Space Station and i'm joined today by glenda brown who's one of our evaa operations specialist she's responsible for training the crews and making sure that everything goes smoothly and probably one of the most exciting things that our astronauts doing that spacewalk so it's really exciting stuff Glenda thanks for being
here I know I’m excited to have you on I

hope they are too sure I’m really happy
to be here and looking forward to all
your great question questions all right
well why don’t we go ahead and get
started you guys and go ahead and ask
your first question this is Dana filet
mignon Thank You Tata why did the
president stop the Space Shuttle
missions why did the president stop the
Space Shuttle missions well you know
that one is a tough one so here’s the
deal President Bush put out a request
for a report got a bunch of experts
together on all things having to do with NASA so that's the interplanetary work that we do all of the mission to earth stuff which is like the satellites that look back at the weather on earth all the programs having to do with any of the exploration that we do including the manned spaceflight program and he commissioned this report to be done to see how much each thing cost and then how much benefit we get back from each of the things and what the results of that report were was that in order to do our exploration of sending people on to
the stars going on to the Moon or Mars

or an asteroid in order to have enough

money to do that we would have to cut

back on something else they looked

around at all of the cost of all of the

projects and it turns out that the space

shuttle program was costing a lot of

money more and more each year because

the shuttles were getting pretty old and

we were having to refurbish those so in

order to come up with enough money that

we could go on and do

exploration they decided to cut the

space shuttle program and in order to do

that they had to make sure we had
another way to get to the International Space Station because we have international partners now all around the world we could ask the Russians if they would be willing to take us to the space station and certainly for a certain cost they would be able to provide that service to us then at the same time we were able to turn on all the exploration money to start working on producing our own way to get back to the stars and we've commissioned several commercial companies to go and build another vehicle that'll take us back to
the International Space Station and then take that same vehicle and launch it off further to the next project that we're going to do it's really the shuttle you know design only to be in low-earth orbit so just a few hundred miles off your surface we want to go tens and hundreds of thousands and millions of miles away so we need a new vehicle we couldn't do that while we still have the shuttle does that make sense yes all right next question goes there a certain plant that can sustain life is very slow can you speak up just a little bit I
just couldn't hear that is there a certain type of plan that can sustain life in space um well so on the International Space Station we are already doing all kinds of plant growth experiments to see what grows in zero gravity and it turns out almost all kinds of plants will grow in zero gravity as long as they have an environment and a substrate substrate to grow on meaning some dirt or something that they can you can plant the seed in and then it can grow and it just needs light and water like here on earth and
it'll grow just fine I know Don Pettit

right now is growing quite a few plants

he's got a cucumber and a broccoli and I

think some sunflowers growing on board

the station right now and he's been
doing a pretty funny blog where he's
talking from the perspective of the

cucumbers it goes on as a crew member on

board the International Space Station so

yeah I mean quite a diverse plant life

can actually exist in space all right

next question guys

how long can a person lemons face how

long can a person live in space ok now

I'm going to assume that you understand
that you have to have an environment in space so you have to have air around you in a pressurized environment and as long as you have that we think that you can live as long as you can here on earth but there you have to take some preventative measures you have to make sure that you're exercising because the grant the earth isn't pulling on your system it's not compressing your bones the way it is here on earth and so what we see on orbit is a loss of bone mass in the bones and we can measure that when crew members come back from space.
so we've implemented an exercise program

with a resistive exercise program that

basically looks like a weight lift

system on on steroid so they put it on a

little high I think it's a hydraulic

kind of system or maybe a spring kind of

system that pushes down on the crew

member on his arms and shoulders while

he's also pushing away on his feet and

that creates some effect of gravity and

that's what keeps their bones strong and

we're finding some great success with

astronauts are exercising like two hours
a day every single day of the week so

some of them are actually saying they're

coming down and was stronger yeah that's

absolutely true alright next question

guys what do people do at Mission

Control now that this shuttle program is

no longer running I'm sorry whoa what do

what do we do in Mission Control now oh

well we still have the International

Space Station which is beyond world

class will call it a eunuch universe

class science platform we can do all

kinds of laboratory experiments up there

and in order to maintain that laboratory
system we have to maintain the

158
00:06:18,839 --> 00:06:23,739
electricity coming in so we have to

159
00:06:20,829 --> 00:06:25,329
manage all the power systems we have to

160
00:06:23,740 --> 00:06:27,639
provide an environment for the crew

161
00:06:25,329 --> 00:06:30,668
members so we have to monitor the

162
00:06:27,639 --> 00:06:33,129
temperature and that the pressure inside

163
00:06:30,668 --> 00:06:34,599
the vehicle as well as the oxygen

164
00:06:33,129 --> 00:06:36,219
balance you need to have a good

165
00:06:34,600 --> 00:06:39,430
balance of oxygen just like here on the

166
00:06:36,220 --> 00:06:41,020
ground so we have to monitor all of

167
00:06:39,430 --> 00:06:44,319
those and then we have to maintain all

168
00:06:41,019 --> 00:06:46,269
of those systems as well so we keep

169
00:06:44,319 --> 00:06:48,639
really busy maintaining the spacesuits

170
00:06:46,269 --> 00:06:51,069
so that we can go outside and either

171
00:06:48,639 --> 00:06:53,649
take annex i experiment outside bring it
back in or maintain the system so for example if the big batteries that are powered by the solar arrays if those were to fail we would have to go outside and change out the big box that was broken and in order to do that we have to maintain our spacesuits and be ready at all times so that's what's keeping me really busy there's a lot of maintenance that has to be done on the spacesuits to get ready as well as training all of the astronauts to be ready to do that here on the ground so we're really busy here at Johnson Space Center taking care of
all those things at the same time all around the entire nation we've got people that are working on planetary exploration mission the planet Earth stuff trying to figure out how we're going to get more data about the earth and and then planning the next manned space flights on to Mars and beyond and in terms of just you know Mission Control here which is where we're again we're sitting right now all the men and women in this room are actually controlling the majority the systems onboard the station it's kind of like a
big remote control vehicle so even though it's you know 240 miles away at any one time and traveling at 17,000 miles an hour people at these computer systems are actually what are controlling it and kind of flying in yeah Mission Control is still man 24 7 365 there are still a lot of work being done here all right next question do astronauts get sick my first time going up into space for does this happen often two astronauts get sick when they go to space well the answer to that is yes mostly and but it only happens right at
the beginning have you guys studied

00:08:33,230 --> 00:08:38,840
about the vestibular system and and how

216
00:08:35,870 --> 00:08:41,539
we have a little organ in our ears that

217
00:08:38,840 --> 00:08:43,910
helps keep our balance the way that

218
00:08:41,539 --> 00:08:46,250
works is there think of them as little

219
00:08:43,909 --> 00:08:48,079
hairs that are inside that your

220
00:08:46,250 --> 00:08:49,700
vestibular inside your inner ear and

221
00:08:48,080 --> 00:08:53,240
there's some fluid in there and it is

222
00:08:49,700 --> 00:08:56,230
always testing how how straight we're

223
00:08:53,240 --> 00:08:58,519
standing up well that fluid needs

224
00:08:56,230 --> 00:09:01,129
greavity to work and when you get to

225
00:08:58,519 --> 00:09:03,500
space it doesn't have that anymore so

226
00:09:01,129 --> 00:09:05,509
your brain thinks if it doesn't know

227
00:09:03,500 --> 00:09:08,179
where you are and just like when you're

228
00:09:05,509 --> 00:09:10,009
on a crazy rollercoaster ride you've
been up there way too long do it I'm over it over and over again you start to feel sick because your vestibular system isn't working and on the opposite side of that I was just talking to one of the astronauts that came back from a mission not long ago and he said that you know your brain unlearned that pretty quickly it kind of turns off those senses and so after a few hours maybe just a few minutes you start to feel better maybe it takes a couple of days but then on the other side of it when you come back from space your brain has to relearn
that so going for a bike ride that first
day is right out because you'd fall
right over because your brain hasn't
relearned how to balance I've heard
stories of astronauts come down and they
fall asleep and they get up to maybe get
a drink of water and they get out of bed
they think they're just going to float
away and then they realize all not
floating they just kind of follow the
ground so it can be a bit of an
adjustment yeah yeah that's all that
microgravity that they're exposed to
lots of fun for them but a little
difficult sometimes yeah really good

how have your spacesuits burden on the moon how much do our spacesuits where

wait okay well let me to answer that in a couple of different ways and let's just to give you so overall by the time you put the space suit on and you have the person inside and you have all of the tools that they need for their job it's a way about 800 pounds here on the ground so you can imagine there's no way that a person could carry that much

weight
around so when we're doing training here

on the ground we'll go out to the neutral buoyancy laboratory so that they can float and do the work in the water just like they would be doing it in space so that's how we create that negative weight or that neutral wait so like you would be in space you'd be weightless that's how we demonstrate that in the neutral buoyancy laboratory so then when you take that 800 pounds to space we'll talk about that first there's very very little gravity in space microgravity is what we call it and it's not enough that you really
weigh anything at all and then when you

go on to the moon the moon is a lot

smaller than the earth it has a smaller

mass so what that means is gravity is a

lot less on the moon it's about 16 that

amount of Earth so can you guys do the

math in your heads real quick what is

one-sixth of 800 is everybody doing it

anybody know the answer is about 133

pounds and of that the crew member

weighs about we we just average about

200 pounds and so the spacesuit without

the crew member and it would weigh 600

pounds so on the moon it would only
Weigh a hundred pounds so a person or at least two people together could pick it up very fascinating stuff it's amazing like the size of the objects they can move when they're up there on the space station I mean you can see them rotating racks that way hundreds or even thousands of pounds down here on earth and they can just kind of toss them around and there's no problem at all mm-hmm very very good very good question excellent questions next one what type of job does a person have to have become an astronaut I'm sorry it sitting
here that type of job does a person have
to have before they become an astronaut
oh okay almost any kind of job you'll
want to have a good background in math
and science that is most important for
gosh so many jobs medical science
engineering building and that's what we
need for astronauts they have to be able
to perform the science experiments they
need to be able to run their is their
systems for their you know all the
breathing air and stuff that they need
all the power systems so they have to
understand some mechanical stuff and
then they also have to understand how to
take care of each other because they
don't have dr. up there so they have to
be their own doctors so they have to
understand some medical stuff too so not
everybody has to do every single thing.
they do divide the work there so as long
as you get a good education in any one
of those areas and then start to work in
one of those areas for a while then you
can apply to be an astronaut and the
Select astronauts every couple years and
there's a many thousands of people apply
and then they kind of break that down
they find that the hundred or so that
they think have all the right stuff all

the math science and medical background

that they're going to need if

they need they're short on doctors they

might take more from the medical field

doesn't necessarily mean that they are

doctors but maybe they've done research

in the laboratory on drugs

pharmaceuticals or something like that

so that's kind of the background we've even had a veterinarian

before let's see we've had lots of

different pilots that have come from the

military and all of them have studied
engineering and a lot of math and

science so definitely all walks of life

but with a focus on that math and

science background yep math science and

medical so any you future astronaut

hopefuls make sure you stick with it if

you want to be an astronaut someday

really focus on your math and science

classes especially in college and your

job and things like that alright next

question

somebody like through crazy face oh I'm

just having trouble hearing you our

microphone must not be very good one
more time what am I you're crazy there's

someone gets crazy up in space oh okay

um well you know I suppose that's

possible just like it is here on the

ground but the doctors here on the

ground go through and there's a

selection process where they kind of

look at the psychological background of

the person each individual person and

they look at family history and then

their history from how they've performed

in their job and so on and how they

handle stressful situations they do a

lot of that kind of testing and so
you're pretty much pre-selected to have

a group of people that aren't going to have a tendency toward mental health issues but say for example you did have someone because that's possible in any field they also have they have a kind of a think of it as a medicine cabinet on board the International Space Station and it has different kinds of drugs that can treat any different kinds of situations so the medical officer on board or the one that's trained most in that would talk to the surgeons on the ground the flight surgeons and then they'd select the medication that would
be applicable for the situation but I

mean these astronauts spend almost two

years together training often in close

quarters and things like that even

before they fly to the International

Space Station so by the time they get up

there it's almost like their family

already so I mean you might bigger with

your brothers and sisters every once in

a while but you know they're they're

really close by the time they get up

there yeah we have an excellent group of

astronauts this way I would be friends

with any of them any day and as a matter
of fact inference with several of them

alright next question guys

how do I should not communicate with

family and friends in modern space oh

wow that was a great leading Wow to

Christians that lead right into each

other well you know I mentioned the

flight surgeons they talked to them

almost every day to see about their

health and so on but we also scheduled

family conferences think of it as

skyping so they have a little video

camera up on board and then they have a

two-way link and they can talk to their
families they usually schedule those on Saturdays so that you know dads can talk to their kids or husbands can talk to their wives wives can talk to their husbands anybody can talk to their parents or wherever you get it set up so they could talk to you if you were in their family you just are right there on your home computer with the little little television that's on or the young bull camera yeah the webcam exactly and just exactly like if you were skyping have all you guys been skyping before if not you should really check it out set
up a link with your grandparents or

something it's really fun alright next

question guys around anybody

yes si el dorado vacuum in the

background of the world or I'm sorry

could he ask that again we couldn't

quite hear I saw that there was a map in

the background of the world what is that

used for oh yeah talking about the world

map what we like to know where the crew

is at all times and so I don't know if

you can quite see it way out there over

the Pacific Ocean you see that little

let me see yeah there it is way out over

the Pacific Ocean you can see where the
international space station is right now

and those little wavy lines that are on there that represents the track on the ground where the space station is flying

over so if people out in the South Pacific or look up in the sky right now

or its after daylight so they probably can't see it because the sun's

too bright but if you're just before or

just after what we call the terminator

that's where it goes from the darker

color to the lighter color the sun's

shining brightly off the space station

and you can see it up in this in an
early morning sky or the early evening

sky so that's where the earth is and

then there's some other circles on their

the other circles represent different

ground stations where we can talk to the

crew from so you see the ones over

Russia those are all the ones where the

Russian communication system can talk to

the crew and then there are some big or

squid bigger lines there's one that kind

of circles over the white line that goes

way around the United style of that area

and then there's a yellow one off to the

other side those are where the TDRs
satellite the tracking data relay

satellite we bounce signals off of that

think of it like a radio tower for your

cell phone it's the same kind of thing

in space there's a big satellite that we

can bounce the signals off to of and

then we can talk to the crew through

that system

yep so just pretty much a tracking

system so we can see where the the crew

and the International Space Station

always are all right any more questions

guys questions you said hi miss design

of military agent and national do they

of military agent and national do they


have to be a pilot from the military

hath not do you have to be a pilot to be

an astronaut if you're in the military

or not and the answer to that is no you
don't have to be a pilot it is something

that helps because you know the NASA is

looking for the top candidate so they

want to know that you can operate

complicated equipment so that might be a

plane which is very complicated you have

to know how to follow a checklist

operate it or it could be could be stuff

in the lab you could be working in a

science lab and that would show that you

can work on complicated things so it
doesn't necessarily have to be a pilot

but somebody who can demonstrate that

they can do complicated operations I

know a lot of our early astronauts were

test pilots and things like that but a

lot of that was because you know the

stuff they were doing it was very new

who's very dangerous and that's what

test pilots are known for doing so a lot

of your early astronauts were test

pilots and a lot of astronauts even now

still come from the military but you

know since the advent of shuttle and

station and all the experiment work and
the science and the engineer and we've
been doing we now have astronauts from
all walks of life so you don't have to
be a test pilot it could help though now
if you're interested in going into the
military though it really will prepare
you for all kinds of things in life so
think about that if you think that you
might want to move on to be an astronaut
or a doctor they'll pay for your school
anything like that and it's a good way
to serve your country before you get out
there and live the rest of your life in
whatever career you choose you can even
stay in the military all right any more

anybody have a question you guys know

wind exhibitions intervenes you never

miss mission movie when the next mission

will be well we're still doing mission

to the international space station all

the time they're actually going to

launch another crew in just about two

weeks from now so the International

Space Station missions are going you

know console we've had people flying in

space 04 / for more than a decade

continuously you know since the early
2000s we call the mission that's going

557
00:22:23,390 --> 00:22:29,300
on right now increment 31 it means it's

558
00:22:26,750 --> 00:22:30,950
the 31st group of people to stay on the

559
00:22:29,299 --> 00:22:34,250
International Space Station we've been

560
00:22:30,950 --> 00:22:36,110
Manning it continuously for 31 different

561
00:22:34,250 --> 00:22:39,019
crews that have come and gone from the

562
00:22:39,019 --> 00:22:42,680
next mission is increment 32 and that's

563
00:22:41,150 --> 00:22:45,050
the one that Joe aqaba is going to

564
00:22:42,680 --> 00:22:47,029
launch on a Soyuz vehicle here in just a

565
00:22:45,049 --> 00:22:48,740
couple of weeks so we're going to keep

566
00:22:47,029 --> 00:22:55,940
having lots and lots of science missions

567
00:22:48,740 --> 00:22:58,450
yep that is basically International

568
00:22:55,940 --> 00:23:00,769
Space Station Oh lying around is best

569
00:22:58,450 --> 00:23:02,600
there's a question we can't hear it
kidneys try to speak roll out into the

microphone another question yes an igloo
to nationalism certain age limit to be
an astronaut I'm not not really
basically as long as you're and you know
good physical shape she could do it I
know John Glenn famously flew on the
shuttle back when he was I think he was
in his late 70s I believe and they did
um nothing like that something like that
and they did a lot of testing on aging
and things like that so there's not
really an age limit to it as long as
you're still you know in a good physical
condition you can withstand the rigors of spaceflight well I think that's about all the time we're going to have for questions today there's some great questions guys I hope you enjoyed your time here in Mission Control and you're able to learn a little bit more about what we're doing here at NASA so again thanks for your questions thank you for being here and joining me today was very exciting stuff oh I loved it anytime just give me a call if I can take a break out from helping the astronauts with their spacesuits stuff I'll come
right over alright thanks guys