never Houston you guys ready for the

event I might yes good I guess it's good

evening to you Bob and I are very ready

endeavour Houston comm check for Nick

and Bob much Mike you're loud and clear

on board node two okay Nick I have you

the same you guys we have you on the big

screen down here too you look huge we

are all right those we appreciate you

are participating in here you're 20 you

go that's really good you guys are you

look you look awesome we've got some

great questions here this was a major

competition we got like thousands of
00:01:08,019 --> 00:01:13,810
questions and these are just a few that

00:01:11,109 --> 00:01:17,759
we we selected to ask you so we'll get

00:01:13,810 --> 00:01:20,409
right into it first thing is first

00:01:17,759 --> 00:01:23,618
question it's about the sounds and

00:01:20,409 --> 00:01:26,170
smells in space can you describe how the

00:01:23,618 --> 00:01:28,780
various parts of the shuttle or the ISS

00:01:26,170 --> 00:01:31,149
how they smell and some of the sounds it

00:01:28,780 --> 00:01:32,920
that you hear that might might describe

00:01:31,149 --> 00:01:39,459
the environment further for your

00:01:32,920 --> 00:01:41,140
followers well that's a good question

00:01:39,459 --> 00:01:43,390
Mike obviously launch is really noisy

00:01:41,140 --> 00:01:45,129
but once you're in the space space

00:01:43,390 --> 00:01:48,519
itself is really quiet but the inside of

00:01:45,129 --> 00:01:51,549
the spacecraft is never quiet this it's
full of fan noise everywhere you go

there's a fan circulating air because

there's no convection that on earth

is caused by gravity and temperature

differences there's no convection up

here to circulate the air for you so

that's the biggest noise we notice about

smells Bob what do you notice up here

well I think one of the most remarkable

smells that you notice in space

everything smells relatively similar

except for food and then one of the

thing and that's that second thing is

the smell that you smell when you


actually go into a place that was

recently at vacuum I've heard it

described as ozone ish also at being attributed to the oxidation of aluminum

but the smell of coming into an area that had just been at vacuum just been at space

is really unique and I haven't smelled it to any place on the ground just coming through the hatch or actually coming back in from an EBA you can smell the EBA crew members or spacewalkers when they come in and they really have a strong smell the smell of space now I know that both you guys very well and
between the tree there's a lot of brain

power and I just can't help to follow up

on that question what do you think

causes that's that smell of space what

do you what do you think it is you think

it's actually space or is it something

else I think the the smell that you get

is actually all the hard work of the

spacewalkers who are outside you know

they spend six or eight hours as like

yourself Mike eight hours on a spacewalk

on the last couple that you had on

Hubble they spend a lot of time outside

working and you can generate probably a
00:03:30,469 --> 00:03:37,550
pretty good odor okay I have a way I

00:03:35,960 --> 00:03:41,450
like to describe that smell to people

00:03:37,550 --> 00:03:44,240
Mike that that smell to me is to metal

00:03:41,449 --> 00:03:47,539
what the smell of toast is to bread if

00:03:44,240 --> 00:03:48,439
that makes any sense yeah that's why I

00:03:47,539 --> 00:03:50,629
always thought it might be some out

00:03:48,439 --> 00:03:52,129
guessing going on there alright thanks

00:03:50,629 --> 00:03:54,229
very much that's question number one

00:03:52,129 --> 00:03:55,849
question number two we're looking for

00:03:54,229 --> 00:03:58,459
funny moments were there any funny

00:03:55,849 --> 00:04:00,409
moments particularly after you first get

00:03:58,459 --> 00:04:02,750
to space you know anything anything

00:04:00,409 --> 00:04:05,180
unusual anything funny went you unbuckle

00:04:02,750 --> 00:04:11,000
zero-g for the first time what was that
like I think we were both smiling when we unbuckled that the funny things are when things that you think you had just 10 seconds ago a gun and there's one thing i lost i still haven't found that five days later so we're too busy to really really have humors up at full speed but it is amusing to watch things and people fly around this as though it were the first time in a new environment and for many of us it is the first time in the new environment
describe as a you know kind of funny in

00:04:45,959 --> 00:04:50,759
the joking sort of a sense but what was

00:04:48,180 --> 00:04:52,949
really fun for me on this flight was to

00:04:50,759 --> 00:04:56,480
see folks get to do things for the first

00:04:52,949 --> 00:04:58,680
time and so to see Terry Virts our pilot

00:04:56,480 --> 00:05:01,319
start floating around and try to work

00:04:58,680 --> 00:05:02,910
his way out of his suit and deal with

00:05:01,319 --> 00:05:05,430
the challenges of weakness

00:05:02,910 --> 00:05:07,320
weightlessness was a was fun to watch

00:05:05,430 --> 00:05:09,030
for me and it was also fun for me to

00:05:07,319 --> 00:05:11,099
share that experience with him as he

00:05:09,029 --> 00:05:13,739
went through it for the first time and

00:05:11,100 --> 00:05:15,780
for Nick going out the hatch it was fun

00:05:13,740 --> 00:05:18,720
for me to watch him go out on his first

00:05:15,779 --> 00:05:20,819
spacewalk and experience that for the
first time so it's not really funny in

the comical sense to Nick didn't do

anything comical during the EBA but it

was fun for me to be there for the first
time a couple of folks got to do those

things that's awesome and it kind of

fallen up to it Bob started talking

about with me with the spacewalks for

both of you can you describe what the

earth looks like I mean either through

the through the windows of the spaceship

is one thing but what did it what was

your impressions of seeing it from the

spacewalk well Mike I think there's a
two things that are really impressive
during the spacewalk the first one is
just the depth of the atmosphere and so
you can see the clouds and the shadow
that they cast I don't know if if you've
ever had the experience of being on the
ground and then had an airplane fly over
you or or had a dense cloud go over you
but that shadow that it cast on the
ground and then that's something that
you can really see the depth of the
atmosphere and notice how high the
clouds actually are you can also see
lightning you can see cities at night
all that's a remarkable pneus that you
can look out the window and kind of see
through a just a little small portal you
kind of have the whole horizon out in
front of you through your space helmet
and it's it's really remarkable to just
to take that all in you have to take
mental pictures because they even the
cameras that we have don't have a wide
enough field of view to take all of that
in and the other remarkable part of
going out for the the spacewalks is
again just thinking about all the people
who come together
make it all possible and so it

00:06:57,718 --> 00:07:01,889
tooken it takes a giant team on the

ground to get us into space and to make

00:06:59,848 --> 00:07:03,300

it all happen I know you had a great

00:07:01,889 --> 00:07:04,949

support team on your previous flights

00:07:03,300 --> 00:07:07,139

and we've had a huge support team and

00:07:04,949 --> 00:07:09,330

just to know all those people are

00:07:07,139 --> 00:07:11,968

rewarded and excited by how things are

00:07:09,329 --> 00:07:14,008

going during the spacewalk is also a

00:07:11,968 --> 00:07:20,848

pretty neat thing if you want to

00:07:14,009 --> 00:07:22,139

describe your first look at the earth

00:07:20,848 --> 00:07:28,589

from the helmet visor it's it's

00:07:22,139 --> 00:07:31,259

really hard to describe Mike I'll try we

00:07:28,589 --> 00:07:33,598

went out the hatch in the dark so I

00:07:31,259 --> 00:07:35,250
couldn't see anything at first except
the underside of space station and

endeavor which were lit in flood lights

and that was beautiful enough and we got

working and at some point in that I

think Steve warned us that our first

sunrise was coming up and I look towards

the horizon and there was this beautiful

hbu blue glow coming towards us and

there isn't much time to watch it but

the once or twice I could watch it

during the spacewalk yesterday it was

just amazing the views panoramic as Bob

said you can in the helmet you can see

so much more than you can through
shuttle windows because you can see
almost 180 degrees of field of view but
that the blue spreads across the horizon
and towards you and then turns orange
and red and the Sun pokes up and the
space station is bathed in a brilliant
light it all happens extremely quickly
and of course it happened 16 times a day
and it's a really stunning sight from
anywhere up here but especially from the
inside of space suit nice job is hard to
describe it but you guys did really well
and following up we have another
question related to what you see during
a spacewalk did you notice any stars

while use Facebook I did see some stars

mica but there are so small compared to

actually being able to look at the earth

and see the lightning or to see the

cities at night that the stars are are

actually very dim compared to the lit up

space station or the Space Shuttle we

did see a very good view of the moon

and like i said the cities at night and

the lightning show that you get through

the atmosphere is just really remarkable

the stars are a little bit tougher to

see you can break out the colors on
individual stars but they're there

00:09:21,320 --> 00:09:28,820
they're hard to compare to just all you

can see on the ground as a bub mention

00:09:23,990 --> 00:09:32,289
the moon I did that watch the moon rise

00:09:28,820 --> 00:09:37,129
behind Bob yesterday once it came up

00:09:32,289 --> 00:09:38,269
through the atmosphere I wasn't sure

00:09:37,129 --> 00:09:39,799
what I was seeing but literally rose

00:09:39,799 --> 00:09:45,859
through the atmosphere so it was a white

00:09:41,659 --> 00:09:47,870
moon behind him blue haze and then all

00:09:45,860 --> 00:09:49,730
of a sudden it was up in the clear black

00:09:47,870 --> 00:09:51,049
of space and I could tell that it really

00:09:49,730 --> 00:09:52,789
was the moon I'd been looking at that

00:09:51,049 --> 00:09:54,379
was really a remarkable thing to see but

00:09:52,789 --> 00:10:00,199
I didn't see any stars yesterday I look

00:09:54,379 --> 00:10:01,820
for them tomorrow that those great
descriptions of what you guys saw out there you know it's just an incredible experience and appreciate you sharing that with us and like you said you got a couple more opportunities to make some more memories so a great job on your first dva and good luck on the next couple will be watching that's a slightly different topic now how are you sleeping how are your sleep patterns up there and how are your dreams affected by being in space well let's sleep patterns aren't affected too much with a couple of exceptions the first is
have a huge what we call a sleep shift
to get here we needed to launch at four
thirty in the morning eastern time and
because of the amount of work you have
to do when you get to to space takes
about a whole afternoons worth of work
to convert the shuttle into something
that's appropriate for living in once
you've launched we needed to make that
just after our lunch time so we were
sleep shifted by about nine or ten hours
to achieve that and that took us a week
or two really to get comfortable with
that huge sleep shift and we're still
roughly on that sleep cycle sleeping

when people in North America are awake

and we're awake when they're asleep but

up here on on on station now that we've

adapted to that sleep schedule we're

more or less sleeping normally they're

just didn't as much

I'm for it as we'd like for us Mike it

was like making a trip to Tokyo right

before we launched and we did a about

three days before the launch we did the

equivalent of transferring to almost

Tokyo time tokyo japan and and going

through that is going to happen on the
other end when we come back so I'm sure

will not only be tired from the mission

but will be tired from those two big

sleep shifts as Nick described when we get back well you have plenty of time to

catch up when you get back to earth of

another question now comes from the los famosos and I'm probably mispronouncing that sixth graders at the Sherman Middle school in Madison Wisconsin so this comes from a bunch of sixth graders so

be prepared they want to know what do

you weigh in space well for a bunch of

sixth graders they asked some pretty tough questions for us you know I think
Nick and I probably have well over 30 years of education between the two of us and getting questions from sixth graders is always the most challenging of them all but I think Nick just demonstrated and I think that we both could show you that we we don't weigh much of anything while we're up here very nice demonstration but you know the 6th grade this will probably be interested probably be interested to hear Mike that although you don't weigh anything you still have mass you still have inertia so if you
300 00:13:06.149 --> 00:13:09.179
start something moving like if I take

301 00:13:07.950 --> 00:13:10.800
Bob and I move them towards the camera

302 00:13:09.179 --> 00:13:12.989
it takes me a second to speed him up I

303 00:13:10.799 --> 00:13:15.809
have to take that same second to slow

304 00:13:12.990 --> 00:13:17.820
him down because he is massive and just

305 00:13:15.809 --> 00:13:19.409
as we all are he'll keep moving in one

306 00:13:17.820 --> 00:13:20.970
direction as long as there's no force

307 00:13:19.409 --> 00:13:22.439
acting on him so there's really some

308 00:13:20.970 --> 00:13:24.649
interesting physics to observe up here

309 00:13:22.440 --> 00:13:30.690
not just the weight but also the mess

310 00:13:24.649 --> 00:13:34.860
thanks Bob well done boys moving on to a

311 00:13:30.690 --> 00:13:40.380
different topic your meals we have this

312 00:13:34.860 --> 00:13:43.019
this comes from chef Casey Wilson and he

313 00:13:40.379 --> 00:13:45.299
or she asks the chef's ass what your

314
meals consist of and is there anything specific that you asked to bring up that you're eating that's maybe a little bit different well Mike I think there's always a lot of interest in what type of food we actually eat on orbit and it's a mixture of kind of camping food and military rations and kind of dehydrated things and so we've kind of got just about everything that you have on the ground just in a slightly different format that we either warm up or add water to and then warm up so those are kind of the two things that we have so
nothing nothing too fancy as far as

00:14:21,059 --> 00:14:27,209
chefs go because we don't get to use all

00:14:24,179 --> 00:14:29,939
the fancy techniques we just get to add

00:14:27,210 --> 00:14:32,820
water or add heat and that's just about

00:14:29,940 --> 00:14:34,350
it for me I brought up some some

00:14:32,820 --> 00:14:36,540
chocolates that I like and I also

00:14:34,350 --> 00:14:38,100
brought up some breakfast rolls and some

00:14:36,539 --> 00:14:39,990
fresh fruit because one of the things

00:14:38,100 --> 00:14:42,600
that you don't have very much of up here

00:14:39,990 --> 00:14:44,850
like I said with all rehydrated or our

00:14:42,600 --> 00:14:46,860
food that you just warm up you don't get

00:14:44,850 --> 00:14:50,310
a lot of vegetables so it's a it is nice

00:14:46,860 --> 00:14:52,710
to to taste citrus and taste fresh

00:14:50,309 --> 00:14:54,479
vegetables during the week or two that

00:14:52,710 --> 00:14:56,790
you're actually on orbit and when we
arrived with the for the station crew we

actually brought them quite a bit of

fresh food I don't think you can see any more

of it here actually you can there's some

of it stowed right above Nick set up

here there's some oranges and some

apples and some avocados and some limits

so a lot of fresh fruits that only get

delivered when there's a progress

vehicle arriving or a space shuttle

arrives to drop some of these things off

okay next question comes from p otras

and they want to know how long do
you prepare for your flight how long do you guys prepare for your space flight well we've been training for about the year Mike we got assigned to this mission i think in december of 2008 so we trained for just over a year before we launched but in a way we've been training for this for all of our lives Bob and I are both engineers Bob's an Air Force flight test engineer and I'm a civilian mechanical engineer as you know because we were at school together but we have literally been training to be astronauts for the last
30 or 40 years through our education one of the things I was struck by yesterday when I was doing my spacewalk is that I think you probably can't feel really comfortable hanging from space station 200 miles above the planet going about 18,000 miles an hour unless you're really confident in the physics that you'll just keep going around the planet than won't fall so in a way I think we've been training a long long time all that education that you guys have between your comes comes in handy next question is from Taiwan Mita and have been training a long long time all that education that you guys have between your comes comes in handy next question is from Taiwan Mita and
the question is what times what types of

experiments do you have on board what

experiments are you guys don't know

you're busy with lots of stuff but if

you have any time for experiments what

are you doing

well Mike we do have a couple of

experiment experiments with us and most

of them are biological in nature really

as far as our flight goes the space

station is doing a quite a bit of

additional work this is an assembly

mission to the space station and so

we're primarily focused on that but the

experiments that we do have we have one
which is an experiment to actually control viruses and so we have a they're in a contained vessel and we cycled them through their process trying to activate them and then deactivate them inside their canister to understand what the effects gravity have gravity has on those viruses we also fly a big freezer it's called a glacier and it keeps biological samples are really cold and also allows us to transfer new science materials either to the station or back down from the station and so just the day that we arrived I opened up that
freezer and exchanged some samples that

Jeff Williams the commander of the space
station right now had on board and swap

those out and I know there'll be a large

number of blood samples and other

samples from the crews that have been on
orbit to make sure that they've been
healthy and understand the effects of

gravity on their health during their
six-month stay on the space station boys

I think we have time for one more

question and this one is pertinent to

our twittering in space this comes from

Richard V Miller he wants to know what
kind of computer do you use to send your tweets and Nick are you able to tweet from space as you know Mike I was tweeting every day before we launched and unfortunately I haven't had enough time to do too much tweeting from up here although I will send another one out today when I send a tweet I have to email it to a colleague on the ground who's agreed to post it for me but when the folks on the space station his sented sweet they're able to do it directly via a live computer link with a machine down in Mission Control
so they're actually able to directly if

00:19:18,240 --> 00:19:23,039
somewhat slowly host their own tweets

00:19:20,400 --> 00:19:27,090
and that's a something that TJ creamer

00:19:23,039 --> 00:19:29,819
the ISS flight engineer up here now has

00:19:27,089 --> 00:19:31,230
just set up with help from colleagues on

00:19:29,819 --> 00:19:34,879
the ground so that's a very exciting

00:19:31,230 --> 00:19:34,880
development for the tweeting community

00:19:35,420 --> 00:19:39,240
well you know you're busy Nick and

00:19:37,890 --> 00:19:41,340
anything you can send down I know the

00:19:39,240 --> 00:19:44,609
folks would be interested in reading

00:19:41,339 --> 00:19:47,429
eventually and we're out of time

00:19:44,609 --> 00:19:49,199
actually amen oh you guys are busy and

00:19:47,430 --> 00:19:51,299
have something else to do it's been a

00:19:49,200 --> 00:19:54,059
real honor for me to work is your cap

00:19:51,299 --> 00:19:56,490
comment to talk to you this evening it's
a real blast then you guys look great

and you're doing a great job and we're all proud of everything you guys are doing anything you want to say to wrap up you want to say hi to anybody or thank anyone or what do you got closing thoughts first cost of it we've got to thank everybody but we won't thank everybody it's a bit like an Oscar speech if you do that I guess we'd like to thank the people who got us here our trainers in Houston and the people at neutral buoyancy lab who make me underwater training possible and flight
control team on the ground those are the
really important groups to think I'd
like to thank my family too for putting
up with my what should we call it
business travel which can be demanding
and Nick covered the folks that that
have got us to this point and also been
supporting us while we're here on orbit
I'd also like to thank my family and my
wife Megan who's also a Capcom for some
other other missions and flew with you
Micah back to the the Space Telescope a
little bit a little while back so I'd
like to thank her specifically as well
all right guys great job this concludes

the event good luck with the rest of the

mission will be talking with you and

looking forward to seeing you on the

ground here about a week's time thanks

Mike