
ARMY

1
00:00:06,230 --> 00:00:01,910
station this is houston are you ready

2
00:00:11,110 --> 00:00:07,909
houston station we are ready for the

3
00:00:14,549 --> 00:00:12,709
vintage high school this is mission

4
00:00:17,590 --> 00:00:14,559
control houston please call station for

5
00:00:19,349 --> 00:00:17,600
a voice check station this is principal

6
00:00:23,990 --> 00:00:19,359
mike pearson here with students from

7
00:00:27,670 --> 00:00:26,150
hey principal pearson i hear you loud

8
00:00:30,230 --> 00:00:27,680
and clear from the international space

9
00:00:31,429 --> 00:00:30,240
station

10
00:00:32,950 --> 00:00:31,439
kate good morning and the rest of the

11
00:00:35,270 --> 00:00:32,960
crew of the international space station

12
00:00:36,630 --> 00:00:35,280
participating in expedition 49

13
00:00:46,389 --> 00:00:36,640

welcome to the home of the crushers

14
00:00:48,869 --> 00:00:47,510
guess what kate we're in the little

15
00:00:50,790 --> 00:00:48,879
theater right now i bet you remember

16
00:00:52,069 --> 00:00:50,800
that uh the vintage student staff

17
00:00:53,350 --> 00:00:52,079
special guest and i are extremely

18
00:00:55,270 --> 00:00:53,360
blessed to have this opportunity to

19
00:00:56,470 --> 00:00:55,280
speak with you today not only are we

20
00:00:57,670 --> 00:00:56,480
honored to talk with an astronaut

21
00:00:59,349 --> 00:00:57,680
currently on the international space

22
00:01:00,790 --> 00:00:59,359
station but we are also very grateful to

23
00:01:02,389 --> 00:01:00,800
share this time with an alumnus of

24
00:01:03,830 --> 00:01:02,399
vintage high school you're an amazing

25
00:01:05,189 --> 00:01:03,840
role model for vintage students and we

26
00:01:06,710 --> 00:01:05,199
are very privileged to share this time

27
00:01:08,149 --> 00:01:06,720
with you i want to introduce jen

28
00:01:14,230 --> 00:01:08,159
castellazo now who is the science

29
00:01:17,590 --> 00:01:16,149
good morning kate and welcome

30
00:01:19,270 --> 00:01:17,600
our vintage high school students are

31
00:01:21,350 --> 00:01:19,280
eager to ask their questions and listen

32
00:01:22,950 --> 00:01:21,360
to and reflect upon your answers so

33
00:01:27,270 --> 00:01:22,960
without further ado

34
00:01:31,109 --> 00:01:29,350
hi kate my name is kaylee ernst and i

35
00:01:36,069 --> 00:01:31,119
was wondering what is it like to look at

36
00:01:39,830 --> 00:01:38,390
hey kaley that is a great question and

37
00:01:41,990 --> 00:01:39,840
that's actually one of the things that's

38
00:01:44,149 --> 00:01:42,000

been the most surprising and amazing to

39
00:01:47,030 --> 00:01:44,159
me about space flight you see a lot of

40
00:01:49,510 --> 00:01:47,040
photographs or even videos or movies

41
00:01:52,069 --> 00:01:49,520
about space but it was so surprising to

42
00:01:53,990 --> 00:01:52,079
me what the earth actually looks like

43
00:01:56,709 --> 00:01:54,000
it really looks like a planet it's

44
00:01:58,310 --> 00:01:56,719
almost glowing it's so bright uh when we

45
00:02:01,270 --> 00:01:58,320
take photography we really have to

46
00:02:04,310 --> 00:02:01,280
adjust our settings and it's beautiful

47
00:02:05,510 --> 00:02:04,320
and the day passes we love to watch the

48
00:02:07,429 --> 00:02:05,520
the

49
00:02:10,150 --> 00:02:07,439
continents go over

50
00:02:11,990 --> 00:02:10,160
the horizon is kind of shining and

51
00:02:13,830 --> 00:02:12,000
glimmering and during the night passes

52
00:02:17,350 --> 00:02:13,840
you can actually see entire continents

53
00:02:21,350 --> 00:02:17,360
worth of thunderstorms up here

54
00:02:25,910 --> 00:02:23,510
um hello my name is diego leyva and i'm

55
00:02:27,990 --> 00:02:25,920
a junior's sophomore here in vintage

56
00:02:29,910 --> 00:02:28,000
high school and my question is on your

57
00:02:31,589 --> 00:02:29,920
journeys to becoming a space researcher

58
00:02:37,350 --> 00:02:31,599
uh did you have any troubles or doubts

59
00:02:41,030 --> 00:02:38,949
i think that's a great question because

60
00:02:43,110 --> 00:02:41,040
we always have some troubles and some

61
00:02:44,710 --> 00:02:43,120
doubts and it's been a long career

62
00:02:46,470 --> 00:02:44,720
getting to the international space

63
00:02:48,470 --> 00:02:46,480

station and so of course there were

64
00:02:50,630 --> 00:02:48,480
times along the way where i thought you

65
00:02:53,030 --> 00:02:50,640
know i can't do this as a researcher or

66
00:02:54,949 --> 00:02:53,040
i can't do this as an astronaut but if

67
00:02:57,030 --> 00:02:54,959
you kind of keep your head down and just

68
00:02:59,030 --> 00:02:57,040
keep plugging away it's actually pretty

69
00:03:00,470 --> 00:02:59,040
amazing where you end up you guys may

70
00:03:02,630 --> 00:03:00,480
even find yourself on the space station

71
00:03:07,190 --> 00:03:02,640
one day

72
00:03:11,830 --> 00:03:09,670
hi kate my name is yoko katahira ables

73
00:03:13,910 --> 00:03:11,840
and i'm a junior here at vintage so my

74
00:03:15,350 --> 00:03:13,920
question was were you nervous or worried

75
00:03:17,030 --> 00:03:15,360
about installing the international

76
00:03:22,390 --> 00:03:17,040
docking adapter and did you fear that

77
00:03:26,390 --> 00:03:24,550
we actually weren't that worried about

78
00:03:27,990 --> 00:03:26,400
any problems that we would have on the

79
00:03:30,070 --> 00:03:28,000
spacewalk because we know that the

80
00:03:31,589 --> 00:03:30,080
ground teams have thought about all of

81
00:03:32,869 --> 00:03:31,599
the different kinds of things that could

82
00:03:34,390 --> 00:03:32,879
go wrong so they actually have

83
00:03:35,990 --> 00:03:34,400
brainstorming

84
00:03:38,869 --> 00:03:36,000
sessions where they sit down and try to

85
00:03:40,789 --> 00:03:38,879
think of every possible contingency and

86
00:03:42,229 --> 00:03:40,799
how to solve them and we did encounter

87
00:03:45,270 --> 00:03:42,239
some difficulties out there with the

88
00:03:46,949 --> 00:03:45,280

connectors but due to the really really

89
00:03:48,789 --> 00:03:46,959
excellent planning and the ground teams

90
00:03:52,229 --> 00:03:48,799
part we just work through all of the

91
00:03:53,830 --> 00:03:52,239
problems but i do i do uh think that i

92
00:03:55,589 --> 00:03:53,840
breathe the pretty big sigh of relief

93
00:03:58,470 --> 00:03:55,599
when the docking adapter was finally

94
00:04:01,990 --> 00:03:58,480
installed on the front of space station

95
00:04:05,589 --> 00:04:04,070
hi kate my name is gunnar de young i'm a

96
00:04:07,670 --> 00:04:05,599
sophomore here at vintage high school

97
00:04:09,589 --> 00:04:07,680
and my question to you is this

98
00:04:11,030 --> 00:04:09,599
what's the most burdensome task you had

99
00:04:12,630 --> 00:04:11,040
to complete

100
00:04:17,590 --> 00:04:12,640
to accomplish your duties onboard the

101
00:04:22,069 --> 00:04:19,430
so i get asked that a lot what's the

102
00:04:24,390 --> 00:04:22,079
hard part about this job and my answer

103
00:04:25,430 --> 00:04:24,400
is both everything is hard and nothing

104
00:04:27,990 --> 00:04:25,440
is hard

105
00:04:30,790 --> 00:04:28,000
we're having so much fun up here that

106
00:04:33,030 --> 00:04:30,800
just every single activity in the day is

107
00:04:35,909 --> 00:04:33,040
so fascinating i'll give you a couple

108
00:04:38,790 --> 00:04:35,919
examples today we sequence the one

109
00:04:41,189 --> 00:04:38,800
billionth base pair of dna we started

110
00:04:43,189 --> 00:04:41,199
out in expedition 48 at zero base pairs

111
00:04:45,189 --> 00:04:43,199
of dna we established the sequencer on

112
00:04:48,070 --> 00:04:45,199
board and we've gotten to a billion base

113
00:04:49,670 --> 00:04:48,080

pairs of dna already so i'm a genomics

114
00:04:51,350 --> 00:04:49,680
background i get really excited about

115
00:04:54,550 --> 00:04:51,360
that kind of stuff

116
00:04:56,790 --> 00:04:54,560
my crewmate takuya and the ground teams

117
00:04:58,629 --> 00:04:56,800
launched two satellites from the space

118
00:05:01,029 --> 00:04:58,639
station today we actually got to see

119
00:05:02,629 --> 00:05:01,039
those pass under us so when you have

120
00:05:04,150 --> 00:05:02,639
those kinds of activities i don't think

121
00:05:07,590 --> 00:05:04,160
that there's really anything that gets

122
00:05:07,600 --> 00:05:11,990
that's awesome thanks kate

123
00:05:15,110 --> 00:05:13,830
hi kate my name is ryan and i'm subbing

124
00:05:17,510 --> 00:05:15,120
in for somebody

125
00:05:19,110 --> 00:05:17,520
i'm a sophomore and my question is

126
00:05:23,430 --> 00:05:19,120
what is your least favorite thing about

127
00:05:27,830 --> 00:05:24,950
that's kind of an easy one there's

128
00:05:29,270 --> 00:05:27,840
nothing everything is pretty fantastic

129
00:05:31,430 --> 00:05:29,280
up here

130
00:05:33,990 --> 00:05:31,440
being in space is amazing just even

131
00:05:35,670 --> 00:05:34,000
little daily things like floating around

132
00:05:37,830 --> 00:05:35,680
or trying to eat breakfast when

133
00:05:40,070 --> 00:05:37,840
everything floats away

134
00:05:40,870 --> 00:05:40,080
it's all kind of a source of of wonder

135
00:05:43,110 --> 00:05:40,880
and

136
00:05:44,870 --> 00:05:43,120
constant fascination because it feels

137
00:05:47,670 --> 00:05:44,880
like the laws of physics have totally

138
00:05:51,029 --> 00:05:47,680

changed up here when you're floating

139
00:05:54,950 --> 00:05:53,350
hello kate my name's cutler low and i'm

140
00:05:56,390 --> 00:05:54,960
a freshman here at vintage and my

141
00:05:58,469 --> 00:05:56,400
question to you is how is the

142
00:06:04,150 --> 00:05:58,479
development of space research advanced

143
00:06:10,390 --> 00:06:06,950
iss has had a long history and it's been

144
00:06:12,309 --> 00:06:10,400
flying for 16 years but even before that

145
00:06:13,990 --> 00:06:12,319
folks were doing development work for

146
00:06:16,790 --> 00:06:14,000
space biology and of course we had a

147
00:06:19,270 --> 00:06:16,800
long space biology program on shuttle

148
00:06:21,749 --> 00:06:19,280
and mir so we actually have quite a

149
00:06:23,909 --> 00:06:21,759
history in this field what space station

150
00:06:25,670 --> 00:06:23,919
has done to advance it is it's an

151
00:06:28,710 --> 00:06:25,680
orbiting laboratory so you can see all

152
00:06:31,749 --> 00:06:28,720
around me in the lab we have equipment

153
00:06:33,670 --> 00:06:31,759
we have scientific experiments going on

154
00:06:35,590 --> 00:06:33,680
the astronauts take part in a lot of

155
00:06:37,510 --> 00:06:35,600
experiments actually as human research

156
00:06:39,830 --> 00:06:37,520
subjects and then we do a lot of

157
00:06:41,270 --> 00:06:39,840
experiments as well and so the kinds of

158
00:06:43,110 --> 00:06:41,280
advances that we've made are

159
00:06:45,830 --> 00:06:43,120
particularly in things like material

160
00:06:47,830 --> 00:06:45,840
science trying to understand

161
00:06:49,990 --> 00:06:47,840
how we're going to go beyond low earth

162
00:06:52,550 --> 00:06:50,000
orbit what we need to do in order to

163
00:06:55,029 --> 00:06:52,560

explore beyond our planet as well as

164
00:06:57,110 --> 00:06:55,039
biological science and human research

165
00:06:58,790 --> 00:06:57,120
cellular and molecular biology i might

166
00:07:01,189 --> 00:06:58,800
be a little biased because that's my

167
00:07:02,950 --> 00:07:01,199
field but i think that's just absolutely

168
00:07:05,749 --> 00:07:02,960
taking off right now and we're starting

169
00:07:08,309 --> 00:07:05,759
to see exponential increases in the

170
00:07:09,510 --> 00:07:08,319
kinds of research and the uh amount of

171
00:07:11,510 --> 00:07:09,520
research that we're getting out of the

172
00:07:15,510 --> 00:07:11,520
space station

173
00:07:19,670 --> 00:07:17,510
hi kate michael uh my name is cole

174
00:07:21,670 --> 00:07:19,680
geshwinder and my question is while

175
00:07:27,350 --> 00:07:21,680
working with heart cells in space what

176
00:07:31,670 --> 00:07:28,950
that's a great question at the heart

177
00:07:33,189 --> 00:07:31,680
cells was a fascinating experiment i

178
00:07:35,189 --> 00:07:33,199
hope you guys got to take a look a

179
00:07:37,589 --> 00:07:35,199
little bit at some of the images and the

180
00:07:39,909 --> 00:07:37,599
videos coming down from that we saw

181
00:07:42,629 --> 00:07:39,919
cardiomyocytes the heart cells actually

182
00:07:44,309 --> 00:07:42,639
beating in space for the first time and

183
00:07:46,550 --> 00:07:44,319
one of the hardest challenges with that

184
00:07:48,869 --> 00:07:46,560
is keeping everything sterile so we have

185
00:07:51,430 --> 00:07:48,879
a special facility that's a glove box

186
00:07:53,350 --> 00:07:51,440
where we can keep everything clean but

187
00:07:55,510 --> 00:07:53,360
it's a little bit of a high risk if you

188
00:07:57,830 --> 00:07:55,520

get one tiny microbe in there it could

189
00:07:59,990 --> 00:07:57,840
ruin your whole experiment so i felt a

190
00:08:01,830 --> 00:08:00,000
lot of pressure to make sure that i kept

191
00:08:04,790 --> 00:08:01,840
everything perfectly sterile and

192
00:08:09,029 --> 00:08:04,800
perfectly clean for the researchers

193
00:08:14,230 --> 00:08:11,430
hello kate my name's angel diaz i'm a

194
00:08:16,390 --> 00:08:14,240
freshman here at vintage high school and

195
00:08:18,070 --> 00:08:16,400
my question for you today is do you

196
00:08:19,990 --> 00:08:18,080
think that if the heart sales react in a

197
00:08:25,270 --> 00:08:20,000
positive way that we could potentially

198
00:08:28,950 --> 00:08:27,110
i think so there's a lot of things that

199
00:08:31,350 --> 00:08:28,960
we're learning from the fundamental

200
00:08:33,990 --> 00:08:31,360
research that we do up here and the

201
00:08:36,709 --> 00:08:34,000
heart cells culture was a demonstration

202
00:08:38,389 --> 00:08:36,719
of how we can do cell culture on orbit

203
00:08:40,550 --> 00:08:38,399
it's also potentially going to lead to

204
00:08:42,870 --> 00:08:40,560
some understanding of how these heart

205
00:08:44,550 --> 00:08:42,880
cells behave in microgravity so the

206
00:08:46,630 --> 00:08:44,560
researchers are studying a number of

207
00:08:49,590 --> 00:08:46,640
different parameters and i think we're

208
00:08:51,910 --> 00:08:49,600
going to learn a lot about the effects

209
00:08:53,509 --> 00:08:51,920
on cell culture and potentially we can

210
00:08:56,070 --> 00:08:53,519
draw some conclusions about

211
00:08:58,550 --> 00:08:56,080
cardiovascular systems we also have a

212
00:09:01,350 --> 00:08:58,560
huge research component that's studying

213
00:09:03,030 --> 00:09:01,360

humans we're the lab rats up here and we

214
00:09:05,829 --> 00:09:03,040
have quite a number of studies that are

215
00:09:08,070 --> 00:09:05,839
looking at our cardiovascular systems as

216
00:09:09,590 --> 00:09:08,080
a whole on board and so we're just

217
00:09:12,470 --> 00:09:09,600
getting a ton of results out of all of

218
00:09:14,949 --> 00:09:12,480
these different kinds of studies

219
00:09:19,110 --> 00:09:17,030
hi kate my name is madison fernandez and

220
00:09:20,949 --> 00:09:19,120
i am a freshman here at vintage

221
00:09:22,870 --> 00:09:20,959
my question to you is can your tests

222
00:09:27,190 --> 00:09:22,880
help prevent cardiovascular disease on

223
00:09:33,110 --> 00:09:30,230
yeah ideally we would like to learn more

224
00:09:34,790 --> 00:09:33,120
about cardiovascular function and that's

225
00:09:37,350 --> 00:09:34,800
one of the fascinating things about

226
00:09:39,430 --> 00:09:37,360
space flight is that normally all of the

227
00:09:42,150 --> 00:09:39,440
fluid that would get drawn down into

228
00:09:44,230 --> 00:09:42,160
your legs floats upward and it's called

229
00:09:46,790 --> 00:09:44,240
fluid shifts and that actually has an

230
00:09:49,430 --> 00:09:46,800
effect on cardiovascular function so we

231
00:09:51,590 --> 00:09:49,440
can use space flight as a variable to

232
00:09:54,470 --> 00:09:51,600
start to help us start to understand a

233
00:09:55,990 --> 00:09:54,480
little bit more about heart function the

234
00:09:58,389 --> 00:09:56,000
other thing that was really fascinating

235
00:09:59,670 --> 00:09:58,399
about the cell experiments is those

236
00:10:01,829 --> 00:09:59,680
actually use

237
00:10:03,590 --> 00:10:01,839
reprogrammed stem cells so those are

238
00:10:06,310 --> 00:10:03,600

adult stem cells

239
00:10:08,630 --> 00:10:06,320
that are programmed to make them behave

240
00:10:10,310 --> 00:10:08,640
like heart cells and that technology in

241
00:10:11,350 --> 00:10:10,320
general is how we're learning a lot

242
00:10:13,030 --> 00:10:11,360
about

243
00:10:14,710 --> 00:10:13,040
all kinds of different cell types

244
00:10:17,030 --> 00:10:14,720
including heart cells and potentially

245
00:10:20,230 --> 00:10:17,040
cardiovascular disease

246
00:10:24,310 --> 00:10:22,470
hi kate my name is samantha garcia and

247
00:10:26,790 --> 00:10:24,320
my question for you is have you

248
00:10:28,949 --> 00:10:26,800
discovered anything unexpected during

249
00:10:30,949 --> 00:10:28,959
your experimental process

250
00:10:35,990 --> 00:10:30,959
if so what and will it affect your

251
00:10:39,269 --> 00:10:37,350
yeah and that's one of the best things

252
00:10:41,030 --> 00:10:39,279
about being a scientist is that you can

253
00:10:43,509 --> 00:10:41,040
do some experiments some things

254
00:10:46,069 --> 00:10:43,519
unexpectedly happen and a lot of times

255
00:10:47,590 --> 00:10:46,079
in science that's how we learn a lot

256
00:10:49,110 --> 00:10:47,600
that's how we make breakthroughs in the

257
00:10:51,030 --> 00:10:49,120
field and so one of the things that's

258
00:10:53,750 --> 00:10:51,040
been really interesting and unexpected

259
00:10:56,150 --> 00:10:53,760
for me is just how fluids behave in

260
00:10:58,150 --> 00:10:56,160
microgravity and so you can see this all

261
00:10:59,269 --> 00:10:58,160
the time we drink our water out of a

262
00:11:01,110 --> 00:10:59,279
drink bag

263
00:11:03,590 --> 00:11:01,120

and you can make bubbles of water and

264
00:11:06,630 --> 00:11:03,600
the way that these fluids behave in

265
00:11:08,150 --> 00:11:06,640
microgravity to me is very unexpected so

266
00:11:10,389 --> 00:11:08,160
one of the key things that i'd like to

267
00:11:13,110 --> 00:11:10,399
take a look at is actually how very

268
00:11:15,430 --> 00:11:13,120
small amounts of fluids behave and how

269
00:11:17,509 --> 00:11:15,440
they're influenced by the types of

270
00:11:19,269 --> 00:11:17,519
material that those fluids are sticking

271
00:11:22,710 --> 00:11:19,279
to

272
00:11:26,949 --> 00:11:25,190
hi kate my name is lindsay newberry and

273
00:11:29,110 --> 00:11:26,959
i'm a senior here at vintage and i was

274
00:11:31,829 --> 00:11:29,120
just wondering what other work besides

275
00:11:32,550 --> 00:11:31,839
molecular biology do you work on like do

276
00:11:34,230 --> 00:11:32,560
you

277
00:11:38,069 --> 00:11:34,240
work on engineering and regulating the

278
00:11:42,069 --> 00:11:39,990
we do we do all of the station

279
00:11:44,389 --> 00:11:42,079
maintenance up here so we actually get a

280
00:11:46,230 --> 00:11:44,399
lot of training on how to do maintenance

281
00:11:48,230 --> 00:11:46,240
it's kind of the same thing as it would

282
00:11:50,949 --> 00:11:48,240
be working on your car or building a

283
00:11:52,949 --> 00:11:50,959
radio in your garage at home and we have

284
00:11:54,550 --> 00:11:52,959
great folks at johnson space center that

285
00:11:56,949 --> 00:11:54,560
train us how to do all that maintenance

286
00:11:59,190 --> 00:11:56,959
so for example just this morning on the

287
00:12:01,509 --> 00:11:59,200
left hand side we're working on

288
00:12:02,949 --> 00:12:01,519

installing a payload and we're doing a

289
00:12:05,030 --> 00:12:02,959
bunch of maintenance to install that

290
00:12:07,829 --> 00:12:05,040
payload and right before i talk to you

291
00:12:11,030 --> 00:12:07,839
guys we were working on the oxygen

292
00:12:13,509 --> 00:12:11,040
recharge system so on the space station

293
00:12:15,190 --> 00:12:13,519
we recycle all of our air and in our

294
00:12:17,430 --> 00:12:15,200
water but every now and then we need a

295
00:12:18,949 --> 00:12:17,440
little bit of recharge of oxygen and so

296
00:12:21,430 --> 00:12:18,959
one of the things that we do as

297
00:12:23,430 --> 00:12:21,440
maintenance is to install new tanks of

298
00:12:24,790 --> 00:12:23,440
oxygen up here so you have to be a

299
00:12:26,470 --> 00:12:24,800
little bit of everything you're a

300
00:12:29,670 --> 00:12:26,480
scientist in the morning maybe and a

301
00:12:34,310 --> 00:12:29,680
plumber or an electrician in the evening

302
00:12:39,430 --> 00:12:37,110
hi kate my name is connor castellazo and

303
00:12:40,870 --> 00:12:39,440
i'm a 10th grader here at vintage and my

304
00:12:42,870 --> 00:12:40,880
question is um

305
00:12:45,030 --> 00:12:42,880
since you're weightless it seems like it

306
00:12:46,949 --> 00:12:45,040
would be hard to control your movements

307
00:12:48,870 --> 00:12:46,959
and where you're going so do you ever

308
00:12:53,110 --> 00:12:48,880
get any bumps or bruises while you're

309
00:12:57,590 --> 00:12:54,949
yeah you have to be careful not to fly

310
00:12:59,750 --> 00:12:57,600
head first into a hatchway and

311
00:13:01,670 --> 00:12:59,760
we notice that new astronauts do that a

312
00:13:04,389 --> 00:13:01,680
lot when they launch themselves through

313
00:13:07,269 --> 00:13:04,399

the module they're used to accounting

314
00:13:09,509 --> 00:13:07,279
for the natural pull of gravity and so

315
00:13:11,750 --> 00:13:09,519
they launch a little bit high like you'd

316
00:13:13,910 --> 00:13:11,760
throw a ball in an arc that's not a good

317
00:13:15,750 --> 00:13:13,920
idea up here on space station because

318
00:13:17,829 --> 00:13:15,760
you're going to go straight in whatever

319
00:13:19,910 --> 00:13:17,839
vector you launch in but you do learn

320
00:13:21,590 --> 00:13:19,920
within just a couple weeks

321
00:13:24,069 --> 00:13:21,600
how you can move yourself around from

322
00:13:26,629 --> 00:13:24,079
place to place so you can go you can

323
00:13:29,430 --> 00:13:26,639
bounce off the walls you can flip upside

324
00:13:32,310 --> 00:13:29,440
down you learn almost naturally and

325
00:13:38,310 --> 00:13:32,320
intuitively how to do that

326
00:13:42,230 --> 00:13:40,069
hi kate my name is emily gallard and i'm

327
00:13:43,750 --> 00:13:42,240
a senior here at vintage i was curious

328
00:13:45,430 --> 00:13:43,760
do you notice if your body is unable to

329
00:13:47,110 --> 00:13:45,440
take on as much physical demands as it

330
00:13:52,470 --> 00:13:47,120
could while on earth is sleep

331
00:13:55,750 --> 00:13:54,150
yeah that's a great question and there's

332
00:13:58,389 --> 00:13:55,760
a lot of people at nasa that study

333
00:13:59,910 --> 00:13:58,399
things like human performance and how we

334
00:14:02,310 --> 00:13:59,920
can get the maximum amount of

335
00:14:04,389 --> 00:14:02,320
performance out of astronauts and human

336
00:14:07,269 --> 00:14:04,399
beings in general one of the things that

337
00:14:09,189 --> 00:14:07,279
we do do up here is a lot of exercise

338
00:14:11,350 --> 00:14:09,199

it's really important in maintaining our

339
00:14:13,590 --> 00:14:11,360
bone and our muscle health so we work

340
00:14:15,590 --> 00:14:13,600
out two and a half hours a day

341
00:14:17,670 --> 00:14:15,600
i really like working out on earth so

342
00:14:19,269 --> 00:14:17,680
it's actually pretty fun for me to be

343
00:14:21,030 --> 00:14:19,279
able to do that and it's really

344
00:14:22,310 --> 00:14:21,040
critically important for our bone and

345
00:14:25,030 --> 00:14:22,320
muscle mass

346
00:14:27,030 --> 00:14:25,040
i do notice that we actually have better

347
00:14:29,110 --> 00:14:27,040
recovery up here so something on the

348
00:14:31,430 --> 00:14:29,120
ground that would be really hard like a

349
00:14:33,269 --> 00:14:31,440
track workout sprinting or a crossfit

350
00:14:35,269 --> 00:14:33,279
workout that would leave me really tired

351
00:14:37,189 --> 00:14:35,279
on the ground i wake up the next morning

352
00:14:38,790 --> 00:14:37,199
and i'm ready to go again so i think

353
00:14:40,710 --> 00:14:38,800
there's something about floating and

354
00:14:42,949 --> 00:14:40,720
being in weightlessness that actually

355
00:14:45,590 --> 00:14:42,959
leads to better recovery and to better

356
00:14:49,350 --> 00:14:45,600
sleep for me

357
00:14:53,189 --> 00:14:51,430
hi kate my name is martha royal and i

358
00:14:55,430 --> 00:14:53,199
was just wondering if there's a

359
00:14:57,590 --> 00:14:55,440
difference in how your body reacts to

360
00:15:03,910 --> 00:14:57,600
exercise and zero gravity than here on

361
00:15:08,870 --> 00:15:06,069
yeah so uh when we're doing all of this

362
00:15:10,949 --> 00:15:08,880
exercise up here we do notice something

363
00:15:13,430 --> 00:15:10,959

on earth which with which is different

364
00:15:16,509 --> 00:15:13,440
than on earth which is um the fact that

365
00:15:19,269 --> 00:15:16,519
on earth a lot of times you get some

366
00:15:21,350 --> 00:15:19,279
stabilization from gravity up here

367
00:15:24,310 --> 00:15:21,360
you're on a pivot point and so you learn

368
00:15:26,790 --> 00:15:24,320
really quickly exactly where to put that

369
00:15:28,550 --> 00:15:26,800
bar on your shoulders you almost have to

370
00:15:31,110 --> 00:15:28,560
have perfect form when you're doing

371
00:15:33,670 --> 00:15:31,120
exercises up here i like it because it

372
00:15:35,749 --> 00:15:33,680
forces you to be a little bit better at

373
00:15:37,990 --> 00:15:35,759
all of your exercises but it's very

374
00:15:39,990 --> 00:15:38,000
different from from gravity where you

375
00:15:41,910 --> 00:15:40,000
can kind of cheat a little bit by having

376
00:15:43,749 --> 00:15:41,920
a stable platform

377
00:15:46,069 --> 00:15:43,759
and in terms of sweating it's kind of

378
00:15:48,790 --> 00:15:46,079
interesting it it just sort of collects

379
00:15:50,710 --> 00:15:48,800
and it'll end up pooling on your face or

380
00:15:53,509 --> 00:15:50,720
pooling on your body so we always have a

381
00:15:55,910 --> 00:15:53,519
towel handy to dab off because the sweat

382
00:15:57,269 --> 00:15:55,920
will just kind of go along your skin

383
00:15:58,629 --> 00:15:57,279
when you're working out really hard up

384
00:16:02,150 --> 00:15:58,639
here

385
00:16:05,430 --> 00:16:03,829
hi kate my name is alexis bettencourt

386
00:16:07,269 --> 00:16:05,440
and i was wondering if you ever get

387
00:16:11,910 --> 00:16:07,279
homesick and if you do what do you do

388
00:16:16,069 --> 00:16:13,749

we're always thinking about our family

389
00:16:18,230 --> 00:16:16,079
and our friends up here and uh one thing

390
00:16:20,389 --> 00:16:18,240
i've noticed about being far away from

391
00:16:22,710 --> 00:16:20,399
home in a remote area i used to do a lot

392
00:16:24,949 --> 00:16:22,720
of work in africa is that you do think

393
00:16:27,509 --> 00:16:24,959
about home a lot more you take it for

394
00:16:29,030 --> 00:16:27,519
granted when you're when you're around

395
00:16:31,030 --> 00:16:29,040
and you're at home and you're with your

396
00:16:33,350 --> 00:16:31,040
loved ones but when you're far away

397
00:16:35,509 --> 00:16:33,360
particularly in a really remote area you

398
00:16:37,990 --> 00:16:35,519
do find yourself thinking about it

399
00:16:39,430 --> 00:16:38,000
and i will notice when we go over

400
00:16:41,430 --> 00:16:39,440
california

401
00:16:43,189 --> 00:16:41,440
i'll wave a little bit at everybody down

402
00:16:45,430 --> 00:16:43,199
there or when we go over houston that's

403
00:16:47,189 --> 00:16:45,440
where my husband lives i always like to

404
00:16:49,590 --> 00:16:47,199
look out the window and see us flying

405
00:16:53,670 --> 00:16:49,600
over those cities

406
00:16:57,749 --> 00:16:55,749
hi kate i'm andrea cohen i was wondering

407
00:17:00,470 --> 00:16:57,759
if there's any vintage courses that help

408
00:17:06,549 --> 00:17:00,480
you become an astronaut or inspired you

409
00:17:11,429 --> 00:17:08,549
yeah and i would say actually all of

410
00:17:13,829 --> 00:17:11,439
them i mean it's amazing to me the

411
00:17:16,470 --> 00:17:13,839
things that i learned in school that are

412
00:17:18,789 --> 00:17:16,480
really coming home to roost here one of

413
00:17:21,510 --> 00:17:18,799

my examples is geography i maybe didn't

414
00:17:23,990 --> 00:17:21,520
pay so much attention to continents or

415
00:17:25,909 --> 00:17:24,000
cities or capitals you really pay

416
00:17:28,710 --> 00:17:25,919
attention to that when you can actually

417
00:17:31,510 --> 00:17:28,720
see it from above so you see the shapes

418
00:17:34,390 --> 00:17:31,520
of all continents you can see the entire

419
00:17:36,470 --> 00:17:34,400
united states in one glance i constantly

420
00:17:37,350 --> 00:17:36,480
find myself looking out the window and

421
00:17:38,789 --> 00:17:37,360
thinking

422
00:17:40,950 --> 00:17:38,799
is that morocco

423
00:17:42,789 --> 00:17:40,960
oh man okay that's the the southern part

424
00:17:45,350 --> 00:17:42,799
of india there you can see all these

425
00:17:47,270 --> 00:17:45,360
recognizable shapes even things like

426
00:17:50,310 --> 00:17:47,280
languages is incredibly important up

427
00:17:51,669 --> 00:17:50,320
here we uh converse in both russian and

428
00:17:53,750 --> 00:17:51,679
in english

429
00:17:55,990 --> 00:17:53,760
with our crewmates and so the ability to

430
00:17:58,230 --> 00:17:56,000
learn a second language is critical of

431
00:17:59,909 --> 00:17:58,240
course science and the math are are some

432
00:18:02,070 --> 00:17:59,919
of the fundamental things that we're

433
00:18:04,710 --> 00:18:02,080
doing up here but all of these other

434
00:18:06,630 --> 00:18:04,720
things really come into play so my

435
00:18:08,150 --> 00:18:06,640
message to you guys is pay attention in

436
00:18:09,270 --> 00:18:08,160
school because you never know what

437
00:18:11,270 --> 00:18:09,280
you're going to need and when you're

438
00:18:12,830 --> 00:18:11,280

going to need it

439
00:18:16,150 --> 00:18:12,840
thank

440
00:18:17,430 --> 00:18:16,160
you hi kay i'm jessica joharo and i was

441
00:18:23,350 --> 00:18:17,440
wondering what is the most difficult

442
00:18:27,669 --> 00:18:25,350
so there's actually a lot of things that

443
00:18:29,750 --> 00:18:27,679
are challenging to control for in space

444
00:18:32,549 --> 00:18:29,760
what we want to do with our experiments

445
00:18:34,470 --> 00:18:32,559
is isolate microgravity as a variable

446
00:18:36,789 --> 00:18:34,480
and so there's all kinds of ways that

447
00:18:39,590 --> 00:18:36,799
you can set up to make sure that your

448
00:18:41,510 --> 00:18:39,600
system is just looking at microgravity

449
00:18:43,750 --> 00:18:41,520
one of the ways that we do that is to

450
00:18:45,990 --> 00:18:43,760
take every single experiment and run an

451
00:18:48,549 --> 00:18:46,000
identical control on the ground so

452
00:18:50,549 --> 00:18:48,559
oftentimes researchers at the same time

453
00:18:52,950 --> 00:18:50,559
that we're doing an experiment on board

454
00:18:55,270 --> 00:18:52,960
are doing that exact same experiment on

455
00:18:57,029 --> 00:18:55,280
the ground and in that way you can make

456
00:18:59,990 --> 00:18:57,039
sure that everything in your system is

457
00:19:02,789 --> 00:19:00,000
identical with the exception of for

458
00:19:05,590 --> 00:19:02,799
onboard microgravity

459
00:19:11,350 --> 00:19:07,590
hi kate we have time for just one more

460
00:19:15,430 --> 00:19:13,430
hi kate my name is madison castellazo

461
00:19:17,029 --> 00:19:15,440
and um since mr pierce is now a

462
00:19:18,870 --> 00:19:17,039
principal we were just wondering what he

463
00:19:21,029 --> 00:19:18,880

was like as a teacher and if you can

464
00:19:26,150 --> 00:19:21,039
remember anything funny from his health

465
00:19:31,190 --> 00:19:28,710
i love that question mr pearson was a

466
00:19:32,950 --> 00:19:31,200
great teacher he was a really really

467
00:19:35,590 --> 00:19:32,960
excellent teacher for me

468
00:19:37,510 --> 00:19:35,600
i still remember his class what i can

469
00:19:40,549 --> 00:19:37,520
tell you is that he was also our soccer

470
00:19:43,510 --> 00:19:40,559
coach and he made us run laps so when

471
00:19:46,070 --> 00:19:43,520
you guys are uh doing your pe or running

472
00:19:49,430 --> 00:19:46,080
your laps uh you can thank mr pearson

473
00:19:52,549 --> 00:19:49,440
for keeping you in excellent health

474
00:19:54,150 --> 00:19:52,559
all right thank you

475
00:19:55,990 --> 00:19:54,160
kate this is mike pearson again thank

476
00:19:57,830 --> 00:19:56,000
you so much for being here i want to see

477
00:19:59,590 --> 00:19:57,840
a vc flag on that spaceship here pretty

478
00:20:01,430 --> 00:19:59,600
soon so please make sure that happens

479
00:20:03,350 --> 00:20:01,440
and i noticed a little bit of a of a

480
00:20:05,990 --> 00:20:03,360
houston twang there that's new i like

481
00:20:07,350 --> 00:20:06,000
that uh so one on behalf of vintage high

482
00:20:09,510 --> 00:20:07,360
school thank you so much for being for

483
00:20:11,430 --> 00:20:09,520
hosting us today this truly is a once in

484
00:20:12,870 --> 00:20:11,440
a lifetime experience uh for all of us

485
00:20:14,950 --> 00:20:12,880
and you've showed all of us that we too

486
00:20:16,710 --> 00:20:14,960
can achieve our dreams uh you might not

487
00:20:17,909 --> 00:20:16,720
know this but we affectionately refer to

488
00:20:20,070 --> 00:20:17,919

vintage as the best school in the

489
00:20:21,510 --> 00:20:20,080
universe uh today thanks to you we are

490
00:20:24,149 --> 00:20:21,520
not only the best school in the universe

491
00:20:25,430 --> 00:20:24,159
but the luckiest school in the universe

492
00:20:26,870 --> 00:20:25,440
and when you leave the space station

493
00:20:28,149 --> 00:20:26,880
please make sure to come back to vintage

494
00:20:32,549 --> 00:20:28,159
high school so we can host you for a

495
00:20:36,710 --> 00:20:34,710
absolutely and it was really a joy a

496
00:20:38,390 --> 00:20:36,720
complete pleasure to talk to all the

497
00:20:41,350 --> 00:20:38,400
students at vintage high school today

498
00:20:57,990 --> 00:20:41,360
and i just want to say go crushers

499
00:21:06,230 --> 00:21:00,789
station this is houston acr

500
00:21:06,240 --> 00:21:09,350
thank you houston

501
00:21:12,149 --> 00:21:10,789
thank you to all participants and guests

502
00:21:13,510 --> 00:21:12,159
from vintage high school you had some

503
00:21:15,110 --> 00:21:13,520
really great questions we are now