
OUSTON TV SD
PAO

1
00:00:07,269 --> 00:00:04,150
everybody and i guess it's just after

2
00:00:09,430 --> 00:00:07,279
noon in georgia welcome to the clark

3
00:00:10,870 --> 00:00:09,440
creek stem academy you're looking at the

4
00:00:13,430 --> 00:00:10,880
international space station flight

5
00:00:15,749 --> 00:00:13,440
control room i'm kyle hearing a public

6
00:00:17,349 --> 00:00:15,759
affairs officer here in the room and

7
00:00:20,950 --> 00:00:17,359
i'm joined by pete

8
00:00:23,429 --> 00:00:20,960
hasbrook he is a space station associate

9
00:00:25,029 --> 00:00:23,439
program scientist so he's

10
00:00:27,189 --> 00:00:25,039
knowledgeable on the science activities

11
00:00:29,990 --> 00:00:27,199
that are ongoing he's also been a long

12
00:00:31,589 --> 00:00:30,000
time flight controller with nasa so he

13
00:00:33,350 --> 00:00:31,599

knows all about what it's like to be a

14
00:00:35,350 --> 00:00:33,360
flight controller in the room so we're

15
00:00:39,830 --> 00:00:35,360
uh we're really happy you guys are with

16
00:00:39,840 --> 00:00:46,150
thank you

17
00:00:50,310 --> 00:00:47,670
good morning and good afternoon to you

18
00:00:55,430 --> 00:00:50,320
all this is pete

19
00:00:58,470 --> 00:00:57,670
and may we present you with our first

20
00:01:00,630 --> 00:00:58,480
question

21
00:01:03,110 --> 00:01:00,640
absolutely we're gonna do our best i'm

22
00:01:05,189 --> 00:01:03,120
as ready as i can be

23
00:01:08,390 --> 00:01:05,199
hi my name is noah bloomer i would like

24
00:01:11,109 --> 00:01:08,400
to know how was curiosity doing

25
00:01:13,109 --> 00:01:11,119
how is curiosity doing on mars curiosity

26
00:01:14,710 --> 00:01:13,119
is doing very well thank you

27
00:01:16,550 --> 00:01:14,720
it's been doing very well going through

28
00:01:19,429 --> 00:01:16,560
its checkout

29
00:01:21,830 --> 00:01:19,439
it's been going through uh its initial

30
00:01:23,109 --> 00:01:21,840
observations and currently it's taken a

31
00:01:25,109 --> 00:01:23,119
long trek

32
00:01:32,550 --> 00:01:25,119
across the surface toward the center of

33
00:01:38,230 --> 00:01:35,190
hi my name is oscar and i wanted to know

34
00:01:41,670 --> 00:01:38,240
how does a telescope work

35
00:01:43,749 --> 00:01:41,680
kepler telescope work how does a kepler

36
00:01:45,830 --> 00:01:43,759
telescope work

37
00:01:47,510 --> 00:01:45,840
the kepler telescope it looks like a

38
00:01:50,149 --> 00:01:47,520

pretty cool instrument it's been in

39
00:01:51,990 --> 00:01:50,159
orbit for about three years and it is

40
00:01:54,550 --> 00:01:52,000
looking for planets

41
00:01:57,749 --> 00:01:54,560
uh the way it works is it stares at a

42
00:01:59,590 --> 00:01:57,759
certain part of the milky way which is

43
00:02:02,069 --> 00:01:59,600
dense with stars

44
00:02:04,870 --> 00:02:02,079
and it's looking for those stars

45
00:02:05,830 --> 00:02:04,880
to blink basically and if those stars

46
00:02:07,910 --> 00:02:05,840
blink

47
00:02:09,669 --> 00:02:07,920
they can tell that a planet or they a

48
00:02:11,910 --> 00:02:09,679
planet may have crossed in front of that

49
00:02:12,790 --> 00:02:11,920
star and made it go just a little bit

50
00:02:14,309 --> 00:02:12,800
dimmer

51
00:02:16,550 --> 00:02:14,319
it's got to be a very sensitive

52
00:02:18,630 --> 00:02:16,560
instrument think of you know a light

53
00:02:20,630 --> 00:02:18,640
bulb way down at the end of the hallway

54
00:02:22,390 --> 00:02:20,640
and something like a piece of sand going

55
00:02:24,630 --> 00:02:22,400
across that light bulb and you've got to

56
00:02:28,470 --> 00:02:24,640
be able to tell that the dimness of that

57
00:02:32,710 --> 00:02:29,910
okay go

58
00:02:34,790 --> 00:02:32,720
hi my name is jacob and i'd like to know

59
00:02:37,350 --> 00:02:34,800
how far has nasa gone

60
00:02:40,390 --> 00:02:37,360
on building the solar cup from the

61
00:02:42,470 --> 00:02:40,400
national geographic november 2012

62
00:02:44,470 --> 00:02:42,480
magazine

63
00:02:45,910 --> 00:02:44,480

i have to say i don't know i appreciate

64
00:02:47,509 --> 00:02:45,920
that you sent that question ahead of

65
00:02:49,270 --> 00:02:47,519
time i tried to do some homework and i

66
00:02:51,350 --> 00:02:49,280
wasn't able to find the information on

67
00:02:52,630 --> 00:02:51,360
that one

68
00:02:56,550 --> 00:02:52,640
wow

69
00:02:56,560 --> 00:03:01,589
okay it didn't take long

70
00:03:07,670 --> 00:03:05,030
is nasa exploring what oh yeah hi my

71
00:03:09,589 --> 00:03:07,680
name is and i'm brody and i would like

72
00:03:11,670 --> 00:03:09,599
to know is

73
00:03:13,830 --> 00:03:11,680
nasa exploring means of living

74
00:03:19,509 --> 00:03:13,840
underwater

75
00:03:21,430 --> 00:03:19,519
we have had several successful programs

76
00:03:24,309 --> 00:03:21,440
of crew members station crew members

77
00:03:26,710 --> 00:03:24,319
especially living underwater

78
00:03:29,110 --> 00:03:26,720
they kind of practice living together as

79
00:03:31,270 --> 00:03:29,120
a team for a week or two at a time they

80
00:03:34,149 --> 00:03:31,280
learn how to cooperate together

81
00:03:35,990 --> 00:03:34,159
and they will go out and do what we call

82
00:03:37,990 --> 00:03:36,000
sort of a water walk instead of a space

83
00:03:39,910 --> 00:03:38,000
walk they'll put on a suit and they'll

84
00:03:42,470 --> 00:03:39,920
go out on the bottom of the ocean and

85
00:03:45,270 --> 00:03:42,480
they'll simulate doing space walks and

86
00:03:46,470 --> 00:03:45,280
construction tasks and communication

87
00:03:48,149 --> 00:03:46,480
so we have

88
00:03:50,710 --> 00:03:48,159

i believe that we've finished that

89
00:03:52,309 --> 00:03:50,720
program it was based off of the tip of

90
00:03:54,229 --> 00:03:52,319
florida and the keys

91
00:03:55,750 --> 00:03:54,239
so it's been very beneficial to us it

92
00:04:00,550 --> 00:03:55,760
helped our current crew members learn

93
00:04:03,350 --> 00:04:00,560
how to be team members on the iss

94
00:04:05,190 --> 00:04:03,360
go ahead graham hi my name is graham i

95
00:04:07,429 --> 00:04:05,200
would like to know why did the shuttle

96
00:04:09,910 --> 00:04:07,439
program end

97
00:04:11,589 --> 00:04:09,920
the shuttle was very successful for us

98
00:04:14,229 --> 00:04:11,599
and it did all of the work that we

99
00:04:16,629 --> 00:04:14,239
needed it to do the shuttle was able to

100
00:04:17,749 --> 00:04:16,639
carry very large and heavy objects into

101
00:04:20,310 --> 00:04:17,759
orbit

102
00:04:22,550 --> 00:04:20,320
and we used it to build the

103
00:04:24,310 --> 00:04:22,560
international space station to launch

104
00:04:25,749 --> 00:04:24,320
and deliver many of the parts of the

105
00:04:27,670 --> 00:04:25,759
space station

106
00:04:29,990 --> 00:04:27,680
and we knew that we had a plan for the

107
00:04:32,629 --> 00:04:30,000
whole space station and when the space

108
00:04:35,270 --> 00:04:32,639
shuttle had delivered its last pieces of

109
00:04:37,030 --> 00:04:35,280
the station and its last cargo it was

110
00:04:38,790 --> 00:04:37,040
time to finish it out

111
00:04:42,070 --> 00:04:38,800
the space shuttle program unfortunately

112
00:04:44,469 --> 00:04:42,080
was a very expensive program to run and

113
00:04:46,310 --> 00:04:44,479

we needed to use those funds for other

114
00:04:48,550 --> 00:04:46,320
things that nasa is doing including the

115
00:04:49,909 --> 00:04:48,560
space station including the kepler

116
00:04:52,629 --> 00:04:49,919
telescope and including other

117
00:04:56,230 --> 00:04:54,230
go ahead nicholas

118
00:04:57,030 --> 00:04:56,240
hi my name is nicholas i would like to

119
00:04:59,189 --> 00:04:57,040
know

120
00:05:00,870 --> 00:04:59,199
how is the kepler's spacecraft

121
00:05:06,550 --> 00:05:00,880
controlled

122
00:05:08,230 --> 00:05:06,560
it uh it's out in orbit around the sun

123
00:05:11,350 --> 00:05:08,240
it's sort of near the earth but it's not

124
00:05:14,550 --> 00:05:11,360
in orbit around the earth so it points

125
00:05:16,550 --> 00:05:14,560
at a certain fixed place in the milky

126
00:05:19,110 --> 00:05:16,560
way looking at stars

127
00:05:20,710 --> 00:05:19,120
and if it were to drift and the only

128
00:05:24,150 --> 00:05:20,720
reason it would drift is because of

129
00:05:26,469 --> 00:05:24,160
solar wind it has little reaction wheels

130
00:05:30,070 --> 00:05:26,479
or maybe big reaction wheels but as

131
00:05:31,990 --> 00:05:30,080
those gyrospoops gyroscopes spin

132
00:05:33,590 --> 00:05:32,000
you can push against them and sort of

133
00:05:36,710 --> 00:05:33,600
push the telescope back to where it's

134
00:05:42,070 --> 00:05:39,909
go ahead my name is nathan how likely is

135
00:05:44,469 --> 00:05:42,080
it that the planet of earth can be hit

136
00:05:46,310 --> 00:05:44,479
by a ashram

137
00:05:49,029 --> 00:05:46,320
well from what i know it's fairly

138
00:05:51,430 --> 00:05:49,039

unlikely uh we do the best that we can

139
00:05:54,150 --> 00:05:51,440
to track asteroids that are out there

140
00:05:56,550 --> 00:05:54,160
beyond the earth's orbit

141
00:05:58,790 --> 00:05:56,560
but if it were to happen it would be

142
00:06:01,270 --> 00:05:58,800
very severe impact obviously so we do

143
00:06:03,189 --> 00:06:01,280
pay as much attention to it as we can

144
00:06:04,870 --> 00:06:03,199
and nasa is looking in the future to

145
00:06:06,870 --> 00:06:04,880
figure out ways to

146
00:06:11,749 --> 00:06:06,880
what to do if we think something would

147
00:06:16,870 --> 00:06:14,469
hi my name is parker i'd like to know

148
00:06:19,749 --> 00:06:16,880
when your body is chemically and

149
00:06:22,629 --> 00:06:19,759
mechanically digesting food why don't

150
00:06:25,270 --> 00:06:22,639
astronauts regurgitate their food due to

151
00:06:27,590 --> 00:06:25,280
the microgravity in space in the space

152
00:06:29,749 --> 00:06:27,600
station great question that's a good

153
00:06:32,150 --> 00:06:29,759
question i agree

154
00:06:34,070 --> 00:06:32,160
if you think of your own body and you

155
00:06:35,749 --> 00:06:34,080
think of the pictures of your stomach

156
00:06:37,189 --> 00:06:35,759
and your intestines

157
00:06:39,510 --> 00:06:37,199
if you look at those they kind of go

158
00:06:41,270 --> 00:06:39,520
zigzag all over the place so they don't

159
00:06:43,510 --> 00:06:41,280
always go down sometimes they go up

160
00:06:46,230 --> 00:06:43,520
sometimes left and right so our bodies

161
00:06:48,870 --> 00:06:46,240
have already developed the mechanism to

162
00:06:51,029 --> 00:06:48,880
move food through the intestines so that

163
00:06:55,430 --> 00:06:51,039

we can digest it so really once you get

164
00:06:58,469 --> 00:06:56,550
go ahead

165
00:06:59,270 --> 00:06:58,479
hi my name is mac and i would like to

166
00:07:01,670 --> 00:06:59,280
know

167
00:07:07,110 --> 00:07:01,680
which new planet shows the most promised

168
00:07:08,390 --> 00:07:07,120
to be inhabitable inhabitable by humans

169
00:07:10,710 --> 00:07:08,400
i don't know

170
00:07:13,589 --> 00:07:10,720
a good example for you but i know that

171
00:07:15,909 --> 00:07:13,599
kepler for instance is finding what we

172
00:07:18,950 --> 00:07:15,919
believe are a lot of new planets around

173
00:07:21,510 --> 00:07:18,960
stars that are in our milky way galaxy

174
00:07:24,870 --> 00:07:21,520
and some of those planets are at the

175
00:07:26,870 --> 00:07:24,880
right distance from their star their sun

176
00:07:29,350 --> 00:07:26,880
to be in what they call the habitable

177
00:07:31,270 --> 00:07:29,360
zone where it's not too hot it's not too

178
00:07:33,189 --> 00:07:31,280
cold and there may be liquid water and

179
00:07:35,430 --> 00:07:33,199
there may be

180
00:07:40,230 --> 00:07:35,440
conditions that would support life at

181
00:07:45,749 --> 00:07:41,909
hi my name is declan i would like to

182
00:07:49,029 --> 00:07:45,759
know what a solar flare is a solar flare

183
00:07:51,510 --> 00:07:49,039
on our sun there are solar storms and we

184
00:07:54,869 --> 00:07:51,520
also call them sun spots and sometimes

185
00:07:58,230 --> 00:07:54,879
those spots have a big eruption and

186
00:07:59,909 --> 00:07:58,240
they'll put out a very large plasma

187
00:08:01,830 --> 00:07:59,919
i'll say eruption

188
00:08:03,749 --> 00:08:01,840

that goes out into space

189
00:08:06,469 --> 00:08:03,759
and generally those aren't a problem for

190
00:08:09,430 --> 00:08:06,479
us unless the sun is turned so that that

191
00:08:11,350 --> 00:08:09,440
sunspot is facing the earth and then

192
00:08:12,629 --> 00:08:11,360
that very large amount of radiation

193
00:08:14,469 --> 00:08:12,639
that's put out

194
00:08:16,710 --> 00:08:14,479
could be a problem for us and they call

195
00:08:18,950 --> 00:08:16,720
that a solar flare it could be a problem

196
00:08:20,309 --> 00:08:18,960
for us because it sends radiation toward

197
00:08:23,270 --> 00:08:20,319
the earth

198
00:08:24,830 --> 00:08:23,280
you may see more auroras as those that

199
00:08:27,670 --> 00:08:24,840
radiation is coming through our

200
00:08:30,070 --> 00:08:27,680
atmosphere and it's also a concern to us

201
00:08:32,230 --> 00:08:30,080
because the astronauts who are in space

202
00:08:34,310 --> 00:08:32,240
are up above most of our atmosphere and

203
00:08:38,790 --> 00:08:34,320
most of the radiation protection that we

204
00:08:41,589 --> 00:08:40,790
hi my name is hunter i would like to

205
00:08:43,909 --> 00:08:41,599
know

206
00:08:45,990 --> 00:08:43,919
how does the spacecraft differ from the

207
00:08:47,990 --> 00:08:46,000
rocket how are

208
00:08:50,310 --> 00:08:48,000
they similar

209
00:08:53,350 --> 00:08:50,320
the spacecraft and the rocket as you

210
00:08:56,150 --> 00:08:53,360
look at a rocket it's very tall

211
00:08:58,630 --> 00:08:56,160
and it takes a lot of propellant to get

212
00:09:01,269 --> 00:08:58,640
a spacecraft whether it's got a crew in

213
00:09:03,509 --> 00:09:01,279

it or a satellite to get that spacecraft

214
00:09:05,750 --> 00:09:03,519
up off the ground and into orbit around

215
00:09:08,389 --> 00:09:05,760
the earth so most of the rocket that you

216
00:09:09,670 --> 00:09:08,399
see is the bottom probably nine tenths

217
00:09:11,509 --> 00:09:09,680
of that rocket

218
00:09:13,910 --> 00:09:11,519
and it's full of propellant and it's got

219
00:09:16,070 --> 00:09:13,920
some engines in it and its whole job is

220
00:09:18,550 --> 00:09:16,080
to get that little spacecraft little in

221
00:09:26,070 --> 00:09:18,560
comparison up into orbit so that that

222
00:09:31,509 --> 00:09:28,790
hi my name is joe and i would like to

223
00:09:33,350 --> 00:09:31,519
know is curiosity controlled by mission

224
00:09:40,949 --> 00:09:33,360
control

225
00:09:41,829 --> 00:09:40,959
here in houston it's out in california

226
00:09:43,910 --> 00:09:41,839
and

227
00:09:44,870 --> 00:09:43,920
it's at the jet propulsion laboratory i

228
00:09:46,790 --> 00:09:44,880
believe

229
00:09:48,870 --> 00:09:46,800
and they are very experienced with

230
00:09:50,949 --> 00:09:48,880
controlling the robot

231
00:09:53,590 --> 00:09:50,959
the rovers on mars

232
00:09:55,750 --> 00:09:53,600
and they have a little different uh way

233
00:09:57,829 --> 00:09:55,760
of operating because they can only see

234
00:09:59,829 --> 00:09:57,839
mars at certain times of the day whereas

235
00:10:01,829 --> 00:09:59,839
here in houston we have continuous

236
00:10:04,470 --> 00:10:01,839
satellite coverage and the iss is going

237
00:10:05,829 --> 00:10:04,480
over the earth around us and in view

238
00:10:07,269 --> 00:10:05,839

continuously

239
00:10:09,110 --> 00:10:07,279
yeah so this

240
00:10:11,190 --> 00:10:09,120
this room that you're looking at here

241
00:10:12,790 --> 00:10:11,200
and and maybe we can get a wide shot of

242
00:10:15,110 --> 00:10:12,800
it for you you may have seen it at the

243
00:10:16,069 --> 00:10:15,120
beginning but this is human space flight

244
00:10:17,110 --> 00:10:16,079
and so

245
00:10:18,790 --> 00:10:17,120
you know we're watching over the

246
00:10:20,389 --> 00:10:18,800
international space station here all of

247
00:10:22,790 --> 00:10:20,399
these the flight controllers you see at

248
00:10:24,949 --> 00:10:22,800
each one of these consoles and for

249
00:10:26,790 --> 00:10:24,959
curiosity there's a mission control

250
00:10:28,790 --> 00:10:26,800
obviously like pete said that they

251
00:10:31,030 --> 00:10:28,800
oversee all the instruments on that uh

252
00:10:33,110 --> 00:10:31,040
on that rover as well

253
00:10:36,150 --> 00:10:33,120
great question

254
00:10:40,069 --> 00:10:36,160
uh mr hasbrook and mr herring we are not

255
00:10:42,230 --> 00:10:40,079
able our image from your uh from houston

256
00:10:44,630 --> 00:10:42,240
is just frozen we're not seeing mission

257
00:10:47,190 --> 00:10:44,640
control i didn't know if that was

258
00:10:48,870 --> 00:10:47,200
um but when you mention when you look at

259
00:10:51,509 --> 00:10:48,880
mission control we're not getting that

260
00:10:53,590 --> 00:10:51,519
view it's just a frozen picture oh okay

261
00:10:55,829 --> 00:10:53,600
well you i guess you can see it behind

262
00:10:57,829 --> 00:10:55,839
me but um but you know there's a bunch

263
00:10:58,870 --> 00:10:57,839

of consoles that that flight controller

264
00:11:02,069 --> 00:10:58,880
supported

265
00:11:04,310 --> 00:11:02,079
look over all the systems we do not

266
00:11:06,470 --> 00:11:04,320
we do not see anything mission control

267
00:11:10,550 --> 00:11:06,480
it's been the same picture since we've

268
00:11:13,350 --> 00:11:10,560
been uh giving you our questions okay

269
00:11:15,269 --> 00:11:13,360
oh there you are yay now we see you

270
00:11:17,190 --> 00:11:15,279
we're excellent i think we had a little

271
00:11:18,389 --> 00:11:17,200
touch okay great technical glitch there

272
00:11:19,990 --> 00:11:18,399
buddy

273
00:11:24,069 --> 00:11:20,000
thank you

274
00:11:25,670 --> 00:11:24,079
he

275
00:11:27,910 --> 00:11:25,680
all right

276
00:11:30,949 --> 00:11:27,920
hi my name is amelia i would like to

277
00:11:35,030 --> 00:11:30,959
know how possible might it be for

278
00:11:37,350 --> 00:11:35,040
cosmonauts to land on an asteroid

279
00:11:40,550 --> 00:11:37,360
we think it is very possible

280
00:11:43,190 --> 00:11:40,560
an asteroid is relatively small so it's

281
00:11:45,350 --> 00:11:43,200
not going to have much gravity so really

282
00:11:47,030 --> 00:11:45,360
instead of landing on it we're going to

283
00:11:49,430 --> 00:11:47,040
fly up next to it

284
00:11:51,590 --> 00:11:49,440
and figure out a way to anchor ourselves

285
00:11:53,030 --> 00:11:51,600
or at least keep the spacecraft near

286
00:11:54,790 --> 00:11:53,040
that asteroid

287
00:11:56,389 --> 00:11:54,800
and then the crew if they're going to

288
00:11:58,949 --> 00:11:56,399

explore it will have to put on

289
00:12:01,030 --> 00:11:58,959
spacesuits and go out and airlock and

290
00:12:03,990 --> 00:12:01,040
again somehow maneuver along that

291
00:12:06,389 --> 00:12:04,000
astronaut asteroid but the gravity is

292
00:12:08,790 --> 00:12:06,399
not going to really easily keep the crew

293
00:12:12,230 --> 00:12:08,800
or the spacecraft next to it

294
00:12:15,430 --> 00:12:14,629
hi my name is samira i would like to

295
00:12:19,269 --> 00:12:15,440
know

296
00:12:20,310 --> 00:12:19,279
how does space travel positively affect

297
00:12:23,350 --> 00:12:20,320
um

298
00:12:24,389 --> 00:12:23,360
how does it

299
00:12:26,710 --> 00:12:24,399
negatively

300
00:12:28,230 --> 00:12:26,720
affect the human body

301
00:12:31,910 --> 00:12:28,240
that's a good question

302
00:12:33,590 --> 00:12:31,920
uh as far as positively affected uh

303
00:12:35,990 --> 00:12:33,600
other than being weightless and being

304
00:12:37,829 --> 00:12:36,000
able to maneuver very easily

305
00:12:39,829 --> 00:12:37,839
i have a hard time thinking of how it's

306
00:12:42,310 --> 00:12:39,839
positively affected there are a lot of

307
00:12:44,389 --> 00:12:42,320
risks that we have to keep track of it's

308
00:12:46,629 --> 00:12:44,399
easy to lose your muscle tone if you're

309
00:12:48,470 --> 00:12:46,639
not pushing off of things or walking to

310
00:12:50,710 --> 00:12:48,480
keep your muscles in shape

311
00:12:53,829 --> 00:12:50,720
we know that the crew members bodies

312
00:12:56,069 --> 00:12:53,839
their bones lose bone mass

313
00:12:57,790 --> 00:12:56,079

which is significant

314
00:12:59,829 --> 00:12:57,800
especially if you compare it to

315
00:13:02,150 --> 00:12:59,839
osteoporosis which older people have

316
00:13:03,910 --> 00:13:02,160
here where their bones get weaker

317
00:13:05,350 --> 00:13:03,920
another thing that happens in spaces

318
00:13:07,990 --> 00:13:05,360
with no gravity

319
00:13:10,310 --> 00:13:08,000
the fluid that normally is pushed down

320
00:13:12,790 --> 00:13:10,320
into our legs can shift up into the crew

321
00:13:14,550 --> 00:13:12,800
members chest and their face starts to

322
00:13:16,310 --> 00:13:14,560
look puffy and that's something that

323
00:13:17,670 --> 00:13:16,320
they get over it just looks a little

324
00:13:21,990 --> 00:13:17,680
funny their first couple of days in

325
00:13:26,470 --> 00:13:23,829
hi my name is lauren i would like to

326
00:13:28,870 --> 00:13:26,480
know what types of weather do cosmonauts

327
00:13:31,509 --> 00:13:28,880
experience in outer space

328
00:13:34,870 --> 00:13:31,519
what types of weather

329
00:13:36,790 --> 00:13:34,880
really the crew members inside the iss

330
00:13:39,030 --> 00:13:36,800
have an environment just like you and i

331
00:13:40,949 --> 00:13:39,040
have here it's what we call a shirt

332
00:13:43,269 --> 00:13:40,959
sleeve environment you don't need a coat

333
00:13:44,790 --> 00:13:43,279
it's nice and warm and comfortable the

334
00:13:46,550 --> 00:13:44,800
humidity is just like you and i

335
00:13:47,430 --> 00:13:46,560
experience

336
00:13:50,310 --> 00:13:47,440
they

337
00:13:53,829 --> 00:13:50,320
though

338
00:13:56,550 --> 00:13:53,839

we do have to worry about probably two

339
00:13:59,030 --> 00:13:56,560
things at least one is the sun in the

340
00:14:00,870 --> 00:13:59,040
sun things can get very hot when you're

341
00:14:03,350 --> 00:14:00,880
not in the sun like on the dark side of

342
00:14:05,670 --> 00:14:03,360
the earth things can get very cold

343
00:14:07,430 --> 00:14:05,680
the other type of space weather and

344
00:14:10,069 --> 00:14:07,440
that's what we call it is space weather

345
00:14:12,310 --> 00:14:10,079
is the radiation environment so if the

346
00:14:13,990 --> 00:14:12,320
crew members were outside on a spacewalk

347
00:14:16,150 --> 00:14:14,000
and there was a solar flare that was

348
00:14:17,990 --> 00:14:16,160
directed toward the earth then would we

349
00:14:19,990 --> 00:14:18,000
would be concerned about the radiation

350
00:14:23,670 --> 00:14:20,000
and if it was severe we would bring them

351
00:14:27,269 --> 00:14:25,350
so um

352
00:14:29,110 --> 00:14:27,279
with respect to your answer with the

353
00:14:31,910 --> 00:14:29,120
last question about positive effects on

354
00:14:34,389 --> 00:14:31,920
the human body there's really none no

355
00:14:36,629 --> 00:14:34,399
positive effects on the human body with

356
00:14:39,350 --> 00:14:36,639
space travel

357
00:14:40,870 --> 00:14:39,360
well you get taller

358
00:14:43,030 --> 00:14:40,880
that's true

359
00:14:44,870 --> 00:14:43,040
you and i as we stand on earth

360
00:14:47,030 --> 00:14:44,880
are affected by gravity and our spines

361
00:14:48,550 --> 00:14:47,040
are always compressed that's why you

362
00:14:49,670 --> 00:14:48,560
might have heard f in the morning when

363
00:14:51,829 --> 00:14:49,680

you get up after you've been lying

364
00:14:53,350 --> 00:14:51,839
horizontal all day your spine has

365
00:14:55,189 --> 00:14:53,360
relaxed a little bit and you're a little

366
00:14:56,949 --> 00:14:55,199
taller in the morning perhaps than you

367
00:14:59,189 --> 00:14:56,959
are at the end of the day

368
00:15:00,790 --> 00:14:59,199
whereas in space you don't have gravity

369
00:15:01,509 --> 00:15:00,800
always pulling you down

370
00:15:04,310 --> 00:15:01,519
so

371
00:15:07,030 --> 00:15:04,320
crew members get an inch or two taller

372
00:15:10,389 --> 00:15:09,030
hi my name is genesis

373
00:15:12,470 --> 00:15:10,399
now i would like to know do the

374
00:15:17,750 --> 00:15:12,480
astronauts have computers on board the

375
00:15:22,470 --> 00:15:20,069
they have a lot of computers on board

376
00:15:23,750 --> 00:15:22,480
most of them are laptop computers

377
00:15:25,269 --> 00:15:23,760
and there are a couple of different kind

378
00:15:27,990 --> 00:15:25,279
of software

379
00:15:29,829 --> 00:15:28,000
the space station software i think is

380
00:15:30,870 --> 00:15:29,839
linux based it's a very technical

381
00:15:32,870 --> 00:15:30,880
language

382
00:15:34,629 --> 00:15:32,880
the laptops that the crew uses for their

383
00:15:36,710 --> 00:15:34,639
timelines and their procedures and for

384
00:15:37,749 --> 00:15:36,720
their email i believe those are windows

385
00:15:39,749 --> 00:15:37,759
based

386
00:15:42,230 --> 00:15:39,759
and then we do have a couple of new

387
00:15:43,990 --> 00:15:42,240
tablet computers on board

388
00:15:47,670 --> 00:15:44,000

and i'm not sure the operating system

389
00:15:51,749 --> 00:15:49,829
go ahead hi my name is george and i

390
00:15:52,710 --> 00:15:51,759
would like to know how does the high

391
00:15:55,430 --> 00:15:52,720
iron

392
00:15:58,230 --> 00:15:55,440
content of largest soil affect the idea

393
00:16:00,790 --> 00:15:58,240
of visiting plants

394
00:16:03,990 --> 00:16:00,800
how does the high iron content i'm not

395
00:16:05,350 --> 00:16:04,000
really sure i do know that it's we're

396
00:16:08,470 --> 00:16:05,360
able to land

397
00:16:11,189 --> 00:16:08,480
mars rovers and other landers on mars so

398
00:16:13,829 --> 00:16:11,199
the iron doesn't affect it in that way

399
00:16:16,470 --> 00:16:13,839
they may be able to use that iron for

400
00:16:18,629 --> 00:16:16,480
some kind of a benefit in construction

401
00:16:19,990 --> 00:16:18,639
if we were going to use martian soil but

402
00:16:21,590 --> 00:16:20,000
beyond that i

403
00:16:25,269 --> 00:16:21,600
probably am not qualified to guess

404
00:16:29,269 --> 00:16:27,030
hi my name is leslie and i would like to

405
00:16:32,470 --> 00:16:29,279
know what new planets are are being

406
00:16:34,150 --> 00:16:32,480
discovered by kepler

407
00:16:36,550 --> 00:16:34,160
well that's a good question

408
00:16:39,189 --> 00:16:36,560
kepler is as it's been staring at the

409
00:16:41,910 --> 00:16:39,199
sky for three years they have identified

410
00:16:43,110 --> 00:16:41,920
something over 400 i think possible

411
00:16:45,910 --> 00:16:43,120
planets

412
00:16:47,350 --> 00:16:45,920
and they as they say have confirmed i

413
00:16:49,350 --> 00:16:47,360

think over a hundred that they are

414
00:16:51,670 --> 00:16:49,360
pretty sure are planets and that may be

415
00:16:53,590 --> 00:16:51,680
just by kepler it may be using space

416
00:16:55,829 --> 00:16:53,600
telescope the hubble or another one to

417
00:16:57,990 --> 00:16:55,839
look at the planet the star after they

418
00:17:00,629 --> 00:16:58,000
found what they think is a planet

419
00:17:02,949 --> 00:17:00,639
the types of planets that we can see

420
00:17:05,429 --> 00:17:02,959
are in they're either very close to that

421
00:17:07,829 --> 00:17:05,439
star or maybe in the habitable zone that

422
00:17:10,150 --> 00:17:07,839
i talked about or maybe farther out so

423
00:17:11,909 --> 00:17:10,160
they may be very close and very hot

424
00:17:13,829 --> 00:17:11,919
heated up by that star

425
00:17:16,470 --> 00:17:13,839
maybe in the zone where there's

426
00:17:18,789 --> 00:17:16,480
mostly gas and water or

427
00:17:20,789 --> 00:17:18,799
let's say methane liquid or they could

428
00:17:25,189 --> 00:17:20,799
be farther out and totally frozen kind

429
00:17:29,430 --> 00:17:27,350
hi my name is maya and i'd like to know

430
00:17:30,630 --> 00:17:29,440
are there experiments using recyclable

431
00:17:38,150 --> 00:17:30,640
material

432
00:17:39,190 --> 00:17:38,160
is that what you said

433
00:17:45,430 --> 00:17:39,200
yes

434
00:17:47,830 --> 00:17:45,440
be the atmosphere of the station and the

435
00:17:50,710 --> 00:17:47,840
water that's in the station

436
00:17:53,590 --> 00:17:50,720
the crew as they urinate we are able to

437
00:17:54,310 --> 00:17:53,600
recycle that into pure water and take

438
00:17:57,270 --> 00:17:54,320

the

439
00:17:59,669 --> 00:17:57,280
harmful anything contaminating out of it

440
00:18:01,590 --> 00:17:59,679
as the atmosphere becomes humid we need

441
00:18:04,150 --> 00:18:01,600
to take the humidity out and we're able

442
00:18:05,990 --> 00:18:04,160
to as we say reclaim the water out of

443
00:18:08,150 --> 00:18:06,000
the atmosphere

444
00:18:09,830 --> 00:18:08,160
we also are able to take the carbon

445
00:18:12,870 --> 00:18:09,840
dioxide and

446
00:18:14,470 --> 00:18:12,880
regenerate that and turn in

447
00:18:17,510 --> 00:18:14,480
either it's a chemical reaction that

448
00:18:20,470 --> 00:18:17,520
will regain some of the oxygen out of it

449
00:18:22,549 --> 00:18:20,480
as far as recyclable hard materials on

450
00:18:24,950 --> 00:18:22,559
board i can't think of very many on the

451
00:18:27,510 --> 00:18:24,960
iss i do know that we're working on a

452
00:18:29,430 --> 00:18:27,520
program for future exploration to be

453
00:18:31,990 --> 00:18:29,440
able to take the trash whether it's food

454
00:18:34,310 --> 00:18:32,000
containers or bottles or duct tape and

455
00:18:36,710 --> 00:18:34,320
turn it into little tiles that might be

456
00:18:38,230 --> 00:18:36,720
used for radiation protection something

457
00:18:40,070 --> 00:18:38,240
that the crew can take their trash and

458
00:18:41,669 --> 00:18:40,080
make it something useful maybe put it

459
00:18:42,870 --> 00:18:41,679
around the inside of their spacecraft or

460
00:18:45,750 --> 00:18:42,880
their sleep station to protect

461
00:18:50,470 --> 00:18:48,070
go ahead just read your question how do

462
00:18:52,630 --> 00:18:50,480
solar flares or solar storms

463
00:18:54,230 --> 00:18:52,640

affect the space station

464
00:18:55,110 --> 00:18:54,240
that's a good question how do solar

465
00:18:57,590 --> 00:18:55,120
flares

466
00:18:58,630 --> 00:18:57,600
affect the space station when a solar

467
00:19:00,390 --> 00:18:58,640
flare

468
00:19:03,110 --> 00:19:00,400
heads toward the earth

469
00:19:05,350 --> 00:19:03,120
all that energy and all that radiation

470
00:19:07,430 --> 00:19:05,360
can tend to heat up the earth's

471
00:19:08,230 --> 00:19:07,440
atmosphere and so it expands a little

472
00:19:10,310 --> 00:19:08,240
bit

473
00:19:13,190 --> 00:19:10,320
and even though it's mostly a vacuum

474
00:19:15,830 --> 00:19:13,200
around the iss there is just a very very

475
00:19:18,230 --> 00:19:15,840
thin bit of atmosphere and the space

476
00:19:20,310 --> 00:19:18,240
station is dragged a little bit by that

477
00:19:22,789 --> 00:19:20,320
atmosphere so if we have a solar flare

478
00:19:24,390 --> 00:19:22,799
and the atmosphere expands we get a

479
00:19:26,710 --> 00:19:24,400
little bit more drag on the space

480
00:19:28,549 --> 00:19:26,720
station and it tends to lower our orbit

481
00:19:33,750 --> 00:19:28,559
so it may mean that we need to do a

482
00:19:40,070 --> 00:19:35,990
what would happen if your spacesuit or

483
00:19:44,390 --> 00:19:42,710
i think it would be unpleasant

484
00:19:47,590 --> 00:19:44,400
you could be it depends on what the

485
00:19:49,669 --> 00:19:47,600
fungi is whether you're reacting to it

486
00:19:52,070 --> 00:19:49,679
you could be itchy

487
00:19:53,750 --> 00:19:52,080
we do take very high precautions to make

488
00:19:55,909 --> 00:19:53,760

sure our space suits are clean after

489
00:19:58,470 --> 00:19:55,919
each use the crew wipes them out with a

490
00:20:00,310 --> 00:19:58,480
fungistat cloth and lets them dry and

491
00:20:04,950 --> 00:20:00,320
make sure that nothing's able to go to

492
00:20:08,310 --> 00:20:06,470
what will happen to the kepler

493
00:20:10,230 --> 00:20:08,320
spacecraft after its mission is

494
00:20:15,029 --> 00:20:10,240
completed

495
00:20:18,549 --> 00:20:15,039
just stay in the orbit it's in right now

496
00:20:20,789 --> 00:20:18,559
uh it is in a sun orbit so it's like the

497
00:20:22,470 --> 00:20:20,799
earth it's going around the sun

498
00:20:25,029 --> 00:20:22,480
it's i don't know how many hundred

499
00:20:27,270 --> 00:20:25,039
thousand miles behind the earth in that

500
00:20:29,270 --> 00:20:27,280
orbit but there's really no danger to

501
00:20:31,190 --> 00:20:29,280
the earth to leave it out there

502
00:20:36,630 --> 00:20:31,200
and once it's finished we'll just leave

503
00:20:41,590 --> 00:20:39,830
how was the moon different from a planet

504
00:20:43,270 --> 00:20:41,600
how is the moon different from a planet

505
00:20:44,710 --> 00:20:43,280
that's a good question i had to look up

506
00:20:47,590 --> 00:20:44,720
the definition

507
00:20:49,909 --> 00:20:47,600
and a planet has to satisfy three things

508
00:20:50,789 --> 00:20:49,919
it has to orbit a star in our case the

509
00:20:53,110 --> 00:20:50,799
sun

510
00:20:55,110 --> 00:20:53,120
it has to be generally round so have

511
00:20:57,669 --> 00:20:55,120
been there long enough to have its

512
00:21:00,070 --> 00:20:57,679
gravity make it into a sphere

513
00:21:02,710 --> 00:21:00,080

and then thirdly it has to have really

514
00:21:04,070 --> 00:21:02,720
cleared its orbit around the sun or

515
00:21:05,590 --> 00:21:04,080
around the star

516
00:21:06,630 --> 00:21:05,600
and so the earth has done all those

517
00:21:08,310 --> 00:21:06,640
things

518
00:21:10,310 --> 00:21:08,320
and really the last item is what got

519
00:21:11,750 --> 00:21:10,320
pluto in trouble it hasn't been there

520
00:21:13,750 --> 00:21:11,760
long enough to have cleared all the

521
00:21:14,950 --> 00:21:13,760
other asteroids and junk out from its

522
00:21:20,710 --> 00:21:14,960
orbit

523
00:21:22,789 --> 00:21:20,720
round and it's really cleared our our

524
00:21:27,669 --> 00:21:22,799
area but since it's not going around the

525
00:21:31,990 --> 00:21:29,830
how is nanotechnology being used in

526
00:21:34,230 --> 00:21:32,000
space

527
00:21:36,230 --> 00:21:34,240
that's a tough question and i don't know

528
00:21:38,390 --> 00:21:36,240
if i know enough i do know of one

529
00:21:39,510 --> 00:21:38,400
experiment where we're using nano

530
00:21:41,430 --> 00:21:39,520
particles

531
00:21:44,149 --> 00:21:41,440
it's called in space

532
00:21:46,710 --> 00:21:44,159
and it's what they call a colloid which

533
00:21:48,310 --> 00:21:46,720
is suspending very tiny particles in a

534
00:21:49,590 --> 00:21:48,320
liquid

535
00:21:52,149 --> 00:21:49,600
and so in this case those would be

536
00:21:55,590 --> 00:21:52,159
nanoparticles and then when you apply a

537
00:21:57,909 --> 00:21:55,600
magnetic field around that liquid it

538
00:21:59,830 --> 00:21:57,919

changes its properties and in this case

539
00:22:01,590 --> 00:21:59,840
it can become more dense

540
00:22:04,390 --> 00:22:01,600
so that's an area of research that might

541
00:22:05,909 --> 00:22:04,400
help us in the future in shock absorbers

542
00:22:11,750 --> 00:22:05,919
making them lighter

543
00:22:17,909 --> 00:22:14,390
are there any nasa underwater research

544
00:22:21,430 --> 00:22:17,919
centers like nasa's aquarius

545
00:22:23,669 --> 00:22:21,440
if so where are they located and what is

546
00:22:26,710 --> 00:22:23,679
being studied

547
00:22:29,270 --> 00:22:26,720
nasa aquarium

548
00:22:36,710 --> 00:22:29,280
aquarius

549
00:22:39,750 --> 00:22:36,720
would you go ahead kyle talk about nemo

550
00:22:41,270 --> 00:22:39,760
i was i pete already referenced the

551
00:22:43,830 --> 00:22:41,280
underwater

552
00:22:46,149 --> 00:22:43,840
the nemo where crew members in the same

553
00:22:48,630 --> 00:22:46,159
kind of environment could learn how to

554
00:22:50,070 --> 00:22:48,640
live together in space for long periods

555
00:22:51,909 --> 00:22:50,080
of time

556
00:22:53,510 --> 00:22:51,919
the only underwater facility that we

557
00:22:55,190 --> 00:22:53,520
have near here

558
00:22:57,110 --> 00:22:55,200
is where the astronauts train for

559
00:23:00,870 --> 00:22:57,120
spacewalks because it's

560
00:23:02,870 --> 00:23:00,880
they can simulate the the environment of

561
00:23:04,950 --> 00:23:02,880
what it's like outside the space station

562
00:23:06,470 --> 00:23:04,960
in fact we have astronauts out at the

563
00:23:08,390 --> 00:23:06,480

swimming pool we call it the neutral

564
00:23:09,750 --> 00:23:08,400
buoyancy laboratory right now

565
00:23:11,590 --> 00:23:09,760
training for their

566
00:23:14,390 --> 00:23:11,600
their mission to the international space

567
00:23:16,630 --> 00:23:14,400
station you probably can see that and so

568
00:23:18,870 --> 00:23:16,640
it simulates what it's like outside the

569
00:23:21,029 --> 00:23:18,880
space station so that's the closest

570
00:23:26,950 --> 00:23:21,039
thing we have near here to

571
00:23:29,430 --> 00:23:28,470
all right we're coming up on a minute

572
00:23:31,029 --> 00:23:29,440
left

573
00:23:32,870 --> 00:23:31,039
if we'd like to go ahead and say our

574
00:23:35,350 --> 00:23:32,880
goodbyes now i'd really appreciate that

575
00:23:37,750 --> 00:23:35,360
we had some awesome questions today so

576
00:23:46,710 --> 00:23:37,760
clark creek stem academy would you like

577
00:23:50,630 --> 00:23:48,630
i don't know if they can still hear us

578
00:23:53,350 --> 00:23:50,640
michael but uh we've had a great time

579
00:23:55,830 --> 00:23:53,360
and and those are uh some really great

580
00:23:58,390 --> 00:23:55,840
thought out questions tough questions

581
00:23:59,990 --> 00:23:58,400
so we uh we really appreciate you all

582
00:24:02,070 --> 00:24:00,000
coming and joining us here in mission

583
00:24:04,470 --> 00:24:02,080
control and letting us come and join you

584
00:24:06,230 --> 00:24:04,480
and uh they're in georgia you guys have

585
00:24:08,789 --> 00:24:06,240
a great day

586
00:24:10,549 --> 00:24:08,799
great thank you so much

587
00:24:11,590 --> 00:24:10,559
we love nasa

588
00:24:14,070 --> 00:24:11,600

thank you