1
00:00:15,110 --> 00:00:11,509
hey marty this is christina cook uh

2
00:00:18,310 --> 00:00:15,120
she's an astronaut wow hi uh we're doing

3
00:00:20,550 --> 00:00:18,320
some math problems on uh missions to

4
00:00:21,990 --> 00:00:20,560
mars oh you mean like orbital injection

5
00:00:23,590 --> 00:00:22,000
velocities enough thrust to get out of

6
00:00:25,429 --> 00:00:23,600
the atmosphere no actually we did those

7
00:00:28,150 --> 00:00:25,439
earlier today oh what are you working on

8
00:00:30,230 --> 00:00:28,160
now well actually we're trying to figure

9
00:00:32,470 --> 00:00:30,240
out how old the first group of

10
00:00:34,549 --> 00:00:32,480
astronauts will be when when they land

11
00:00:37,910 --> 00:00:34,559
on mars oh well can you show me yeah

12
00:00:41,110 --> 00:00:37,920
sure so right now nasa has plans for a

13
00:00:43,190 --> 00:00:41,120

human mars mission in the 2030s so okay

14
00:00:44,790 --> 00:00:43,200
let's say pick a number in the middle

15
00:00:47,990 --> 00:00:44,800
2035.

16
00:00:49,270 --> 00:00:48,000
right now it's 2017. so how many years

17
00:00:51,189 --> 00:00:49,280
away is that

18
00:00:54,310 --> 00:00:51,199
let's subtract and see

19
00:00:56,950 --> 00:00:54,320
18 years so we can say humans will walk

20
00:00:58,470 --> 00:00:56,960
on mars in about 18 years

21
00:01:00,150 --> 00:00:58,480
so let's say you're a middle school

22
00:01:01,189 --> 00:01:00,160
student and you're around 11 years old

23
00:01:04,070 --> 00:01:01,199
let's see if that would make you the

24
00:01:08,390 --> 00:01:06,550
in 18 years middle school students are

25
00:01:10,070 --> 00:01:08,400
going to be around 29 years old which is

26
00:01:12,390 --> 00:01:10,080
the exact

27
00:01:14,710 --> 00:01:12,400
great age to start a career as an

28
00:01:16,469 --> 00:01:14,720
astronaut so it's entirely possible that

29
00:01:18,310 --> 00:01:16,479
the first person to walk on mars could

30
00:01:20,550 --> 00:01:18,320
be in middle school today

31
00:01:23,190 --> 00:01:20,560
wow we have got to talk more about this

32
00:01:26,690 --> 00:01:23,200
well we have about 30 minutes

33
00:01:41,710 --> 00:01:26,700
this is 7 30.

34
00:01:41,720 --> 00:01:47,510
[Music]

35
00:01:47,520 --> 00:01:53,000
this is 7 30.

36
00:01:53,010 --> 00:02:05,990
[Music]

37
00:02:10,309 --> 00:02:08,070
hi i'm marty and i'm beth we are coming

38
00:02:12,309 --> 00:02:10,319

to you today live from the smithsonian

39
00:02:14,550 --> 00:02:12,319
stephen f udvar housing center in

40
00:02:16,550 --> 00:02:14,560
chantilly virginia and today our program

41
00:02:18,550 --> 00:02:16,560
is all about women who are paving the

42
00:02:20,070 --> 00:02:18,560
way to mars there have been many women

43
00:02:22,790 --> 00:02:20,080
that have been vitally important to

44
00:02:24,710 --> 00:02:22,800
america's space program including the 28

45
00:02:27,110 --> 00:02:24,720
women who flew on board space shuttle

46
00:02:29,030 --> 00:02:27,120
discovery that you see right behind us

47
00:02:32,150 --> 00:02:29,040
one of them was eileen collins who on

48
00:02:33,990 --> 00:02:32,160
sts 63 became the first female space

49
00:02:35,670 --> 00:02:34,000
shuttle pilot she later went on to

50
00:02:36,630 --> 00:02:35,680
become the first commander of a space

51
00:02:38,869 --> 00:02:36,640
shuttle

52
00:02:41,509 --> 00:02:38,879
also you may have heard recently that

53
00:02:43,750 --> 00:02:41,519
peggy whitson had just broken the record

54
00:02:46,630 --> 00:02:43,760
for the all-time female space walking

55
00:02:48,710 --> 00:02:46,640
times peggy has walked in space

56
00:02:51,750 --> 00:02:48,720
more than any other female astronaut and

57
00:02:53,270 --> 00:02:51,760
she's also in the top five of all time

58
00:02:55,190 --> 00:02:53,280
you may have also heard of astronaut

59
00:02:57,270 --> 00:02:55,200
sally ride the first american woman in

60
00:02:59,509 --> 00:02:57,280
space but it wasn't just her there were

61
00:03:01,270 --> 00:02:59,519
a lot of other females that helped get

62
00:03:02,790 --> 00:03:01,280
her into space

63
00:03:04,710 --> 00:03:02,800

today we're going to take a look at some

64
00:03:06,390 --> 00:03:04,720
of those pioneering women and some of

65
00:03:09,110 --> 00:03:06,400
the women that we may see on the red

66
00:03:10,470 --> 00:03:09,120
planet we have some great students with

67
00:03:11,990 --> 00:03:10,480
us today we've got some school groups

68
00:03:14,309 --> 00:03:12,000
some homeschool groups and some girl

69
00:03:17,030 --> 00:03:14,319
scouts they are revved up and ready to

70
00:03:19,030 --> 00:03:17,040
go these guys are out of this world we

71
00:03:21,430 --> 00:03:19,040
want to remind everyone who's watching

72
00:03:23,670 --> 00:03:21,440
online that you can submit questions

73
00:03:25,589 --> 00:03:23,680
live and we may take some on the air if

74
00:03:27,430 --> 00:03:25,599
not we do have an expert standing by to

75
00:03:29,430 --> 00:03:27,440
answer them that's right right now get

76
00:03:31,030 --> 00:03:29,440
your computers out start typing in the

77
00:03:32,789 --> 00:03:31,040
questions and send them in and we will

78
00:03:34,710 --> 00:03:32,799
be answering them live well let's take a

79
00:03:36,309 --> 00:03:34,720
look at some of these uh groundbreaking

80
00:03:37,670 --> 00:03:36,319
women who are paving the way to mars

81
00:03:39,350 --> 00:03:37,680
these vignettes were written by our

82
00:03:40,390 --> 00:03:39,360
friends at stone middle school check

83
00:03:42,070 --> 00:03:40,400
them out

84
00:03:43,750 --> 00:03:42,080
hello my name is bohr and today i'll be

85
00:03:45,430 --> 00:03:43,760
talking about someone i truly honor her

86
00:03:47,430 --> 00:03:45,440
name is bessie coleman bessie's of

87
00:03:49,030 --> 00:03:47,440
native american and african-american

88
00:03:50,869 --> 00:03:49,040

descent from her father she went to

89
00:03:52,869 --> 00:03:50,879
missionary baptist school and langston

90
00:03:54,229 --> 00:03:52,879
university she unfortunately could only

91
00:03:56,309 --> 00:03:54,239
complete one term as she didn't have

92
00:03:58,789 --> 00:03:56,319
enough funds to continue bessie found

93
00:04:00,149 --> 00:03:58,799
her passion for aviation when she was 23

94
00:04:02,309 --> 00:04:00,159
and began listening to and reading

95
00:04:04,229 --> 00:04:02,319
stories about world war one pilots when

96
00:04:05,750 --> 00:04:04,239
bessie started her career in aviation it

97
00:04:08,149 --> 00:04:05,760
was a time when people were heavily

98
00:04:10,149 --> 00:04:08,159
limited by race and or gender coleman

99
00:04:11,910 --> 00:04:10,159
took on this challenge and did not fail

100
00:04:13,670 --> 00:04:11,920
being an african-american woman myself

101
00:04:15,030 --> 00:04:13,680
she has shown me that even if things are

102
00:04:16,550 --> 00:04:15,040
going against you if you put your mind

103
00:04:19,509 --> 00:04:16,560
to it work hard you can accomplish your

104
00:04:21,990 --> 00:04:19,519
dreams and goals hello my name is susan

105
00:04:24,629 --> 00:04:22,000
and the pioneer i chose is jacqueline

106
00:04:26,230 --> 00:04:24,639
cochran jacqueline grew up in poverty

107
00:04:29,110 --> 00:04:26,240
which may have discouraged some from

108
00:04:31,189 --> 00:04:29,120
doing great things but not her to her

109
00:04:33,270 --> 00:04:31,199
poverty seemed like a cage trapping her

110
00:04:35,110 --> 00:04:33,280
from seeing the world because jacqueline

111
00:04:36,870 --> 00:04:35,120
couldn't get an education she began

112
00:04:39,670 --> 00:04:36,880
working hard to earn money at a very

113
00:04:41,749 --> 00:04:39,680

young age by the age of 13 jacqueline

114
00:04:43,670 --> 00:04:41,759
had become a skilled hairdresser this

115
00:04:45,909 --> 00:04:43,680
led her to greater opportunities in new

116
00:04:47,830 --> 00:04:45,919
york and miami which was where she found

117
00:04:49,430 --> 00:04:47,840
her pathway to being an aviator

118
00:04:51,909 --> 00:04:49,440
jacqueline was the first woman to break

119
00:04:53,990 --> 00:04:51,919
the sound barrier and set 73 flying

120
00:04:55,990 --> 00:04:54,000
records in the course of three years in

121
00:04:57,990 --> 00:04:56,000
the 20th century many people thought

122
00:04:59,590 --> 00:04:58,000
women couldn't do things men did this

123
00:05:01,909 --> 00:04:59,600
only prompt jacqueline to prove them

124
00:05:03,590 --> 00:05:01,919
wrong flying meant everything to her and

125
00:05:05,350 --> 00:05:03,600
she would become the best regardless of

126
00:05:07,510 --> 00:05:05,360
gender if there's something you're

127
00:05:09,670 --> 00:05:07,520
passionate about then go for it life is

128
00:05:11,830 --> 00:05:09,680
about pursuing you and your goals your

129
00:05:13,510 --> 00:05:11,840
life isn't owned by anyone but you so

130
00:05:14,550 --> 00:05:13,520
take that chance and fly towards your

131
00:05:16,870 --> 00:05:14,560
dreams

132
00:05:18,469 --> 00:05:16,880
my name is carson coleman and i i am

133
00:05:20,710 --> 00:05:18,479
very impressed by katherine sullivan's

134
00:05:22,469 --> 00:05:20,720
career as an astronaut i was astonished

135
00:05:24,310 --> 00:05:22,479
to find out that catherine sullivan was

136
00:05:26,310 --> 00:05:24,320
the first american woman astronaut to

137
00:05:29,510 --> 00:05:26,320
step out of a spacecraft and walk in

138
00:05:32,870 --> 00:05:29,520

space on october 11th 1984. catherine

139
00:05:35,510 --> 00:05:32,880
sullivan was born on october 3rd 1951

140
00:05:37,830 --> 00:05:35,520
and is currently 65 years old katherine

141
00:05:39,749 --> 00:05:37,840
graduated from taft high school and then

142
00:05:41,510 --> 00:05:39,759
went on to the university of california

143
00:05:42,710 --> 00:05:41,520
at santa cruz then received her

144
00:05:45,909 --> 00:05:42,720
doctorate

145
00:05:47,990 --> 00:05:45,919
at dalhousie university in canada before

146
00:05:49,270 --> 00:05:48,000
joining nasa as an astronaut when

147
00:05:51,110 --> 00:05:49,280
katherine retired from being an

148
00:05:54,390 --> 00:05:51,120
astronaut and working at nasa she had

149
00:05:55,990 --> 00:05:54,400
been in space 532 hours catherine is a

150
00:05:57,510 --> 00:05:56,000
great inspiration because she did one of

151
00:05:59,430 --> 00:05:57,520
the most dangerous things in the world

152
00:06:01,029 --> 00:05:59,440
and did an amazing job while doing it

153
00:06:02,790 --> 00:06:01,039
this means a lot to me because it shows

154
00:06:04,870 --> 00:06:02,800
that i can overcome my own fears

155
00:06:06,950 --> 00:06:04,880
katherine is a great role model and an

156
00:06:08,309 --> 00:06:06,960
amazing person to look up to

157
00:06:11,830 --> 00:06:08,319
because she proved to us that we can

158
00:06:13,909 --> 00:06:11,840
accomplish anything we put our minds to

159
00:06:16,070 --> 00:06:13,919
we are joined by abigail harrison you

160
00:06:17,830 --> 00:06:16,080
might know her better as astronaut abby

161
00:06:19,270 --> 00:06:17,840
she is a college student who a long time

162
00:06:20,710 --> 00:06:19,280
ago set her sights on becoming an

163
00:06:22,950 --> 00:06:20,720

astronaut abby thanks for joining us

164
00:06:24,950 --> 00:06:22,960
today yeah thanks for having me on marty

165
00:06:26,230 --> 00:06:24,960
now let's get this straight you are not

166
00:06:28,710 --> 00:06:26,240
an astronaut

167
00:06:30,870 --> 00:06:28,720
nope not yet but but you're trying to be

168
00:06:33,270 --> 00:06:30,880
exactly watch out in five to ten years

169
00:06:34,950 --> 00:06:33,280
and you might see me in space now why do

170
00:06:36,870 --> 00:06:34,960
you want to be an astronaut for me it's

171
00:06:38,710 --> 00:06:36,880
always been about the joy of discovery

172
00:06:40,629 --> 00:06:38,720
so this idea of going somewhere that

173
00:06:42,629 --> 00:06:40,639
we've never gone before seeing things

174
00:06:44,309 --> 00:06:42,639
that we've never seen and really making

175
00:06:45,909 --> 00:06:44,319
discoveries that will hopefully benefit

176
00:06:47,189 --> 00:06:45,919
humankind

177
00:06:49,589 --> 00:06:47,199
what kind of things are you doing to

178
00:06:51,510 --> 00:06:49,599
prepare yourself to become an astronaut

179
00:06:53,270 --> 00:06:51,520
the most important thing that i'm doing

180
00:06:54,870 --> 00:06:53,280
to prepare to become an astronaut is

181
00:06:57,029 --> 00:06:54,880
education so i'm getting an

182
00:06:58,870 --> 00:06:57,039
undergraduate degree in astrobiology in

183
00:07:02,070 --> 00:06:58,880
russian

184
00:07:04,469 --> 00:07:02,080
i'm also training as a scuba diver i'm

185
00:07:07,350 --> 00:07:04,479
training to run a marathon i'm learning

186
00:07:09,029 --> 00:07:07,360
mandarin chinese and i'm i just recently

187
00:07:10,710 --> 00:07:09,039
started training for my private pilot's

188
00:07:12,870 --> 00:07:10,720

license you've got just a few things

189
00:07:15,830 --> 00:07:12,880
going on but flying is that something

190
00:07:18,550 --> 00:07:15,840
that those aren't even my

191
00:07:19,830 --> 00:07:18,560
does does that ever get scary flying

192
00:07:21,749 --> 00:07:19,840
it's a little bit frightening at the

193
00:07:24,230 --> 00:07:21,759
beginning in the same way that driving a

194
00:07:25,670 --> 00:07:24,240
car is because it's a new experience and

195
00:07:27,589 --> 00:07:25,680
there's a lot more that you have to pay

196
00:07:29,270 --> 00:07:27,599
attention to rather than just having

197
00:07:31,749 --> 00:07:29,280
forwards and backwards and left and

198
00:07:33,110 --> 00:07:31,759
right you suddenly have six degrees you

199
00:07:34,950 --> 00:07:33,120
also have up and down that you have to

200
00:07:36,710 --> 00:07:34,960
be watching and so that's a little

201
00:07:38,629 --> 00:07:36,720
intimidating but once you get used to it

202
00:07:40,390 --> 00:07:38,639
it's really not very frightening

203
00:07:42,390 --> 00:07:40,400
now you've also founded the mars

204
00:07:44,950 --> 00:07:42,400
generation tell us about that yeah so

205
00:07:47,749 --> 00:07:44,960
the mars generation is a space and stem

206
00:07:49,830 --> 00:07:47,759
advocacy group so we work to inspire and

207
00:07:52,230 --> 00:07:49,840
excite young people especially about

208
00:07:54,550 --> 00:07:52,240
space exploration and why it's important

209
00:07:56,950 --> 00:07:54,560
to the future of humanity uh something

210
00:07:58,550 --> 00:07:56,960
that we're we're really um

211
00:08:00,390 --> 00:07:58,560
starting right now is our student space

212
00:08:02,390 --> 00:08:00,400
ambassador program which is where we're

213
00:08:04,150 --> 00:08:02,400

inviting students ranging from

214
00:08:05,909 --> 00:08:04,160
elementary school all the way up to

215
00:08:07,510 --> 00:08:05,919
college so that means all of you and

216
00:08:09,550 --> 00:08:07,520
hopefully everyone who's watching as

217
00:08:11,830 --> 00:08:09,560
well to come join us at the

218
00:08:14,230 --> 00:08:11,840
marsgeneration.org as students based

219
00:08:15,670 --> 00:08:14,240
ambassadors to their communities nice

220
00:08:16,950 --> 00:08:15,680
were you ready to take some questions

221
00:08:18,550 --> 00:08:16,960
absolutely all right so if you've got

222
00:08:19,909 --> 00:08:18,560
questions watching online be sure to

223
00:08:22,150 --> 00:08:19,919
submit them right now we're going to

224
00:08:24,390 --> 00:08:22,160
start with a video question

225
00:08:27,909 --> 00:08:24,400
hi my name is ellie and i was wondering

226
00:08:29,189 --> 00:08:27,919
how long the trip to mars will take

227
00:08:31,589 --> 00:08:29,199
how long is it going to take us to get

228
00:08:33,589 --> 00:08:31,599
to mars so the current estimates with

229
00:08:36,070 --> 00:08:33,599
the technology that we have today is

230
00:08:38,469 --> 00:08:36,080
about six to eight months to get to mars

231
00:08:40,949 --> 00:08:38,479
and the same amount of time to get back

232
00:08:43,350 --> 00:08:40,959
however a round trip to mars is

233
00:08:44,949 --> 00:08:43,360
estimated at about three years and the

234
00:08:46,470 --> 00:08:44,959
reason for that there are a couple

235
00:08:48,710 --> 00:08:46,480
reasons but one of them is that we've

236
00:08:50,550 --> 00:08:48,720
traveled so far to get there we probably

237
00:08:52,550 --> 00:08:50,560
want to spend a little bit of time on

238
00:08:54,550 --> 00:08:52,560

the surface also right might be a little

239
00:08:56,870 --> 00:08:54,560
bit of science to do that it almost

240
00:08:58,710 --> 00:08:56,880
seems like there's a reason we're going

241
00:09:01,030 --> 00:08:58,720
um the other one is that we have to wait

242
00:09:02,389 --> 00:09:01,040
for the trajectories of the the two

243
00:09:03,990 --> 00:09:02,399
planets to line up well because we don't

244
00:09:06,230 --> 00:09:04,000
want to be traveling when they're on

245
00:09:07,509 --> 00:09:06,240
opposite sides of the sun obviously

246
00:09:08,949 --> 00:09:07,519
that's just making it harder on

247
00:09:10,550 --> 00:09:08,959
ourselves it makes a little bit harder

248
00:09:12,470 --> 00:09:10,560
all right let's go to an online question

249
00:09:14,389 --> 00:09:12,480
next

250
00:09:16,150 --> 00:09:14,399
how old do you have to be to become an

251
00:09:17,990 --> 00:09:16,160
astronaut

252
00:09:20,630 --> 00:09:18,000
pardon so this is a little bit

253
00:09:22,949 --> 00:09:20,640
surprising so surprising that i coughed

254
00:09:25,430 --> 00:09:22,959
um that in order to be an astronaut you

255
00:09:27,430 --> 00:09:25,440
really only have to be 18 years old so

256
00:09:29,190 --> 00:09:27,440
you have to be a legal adult citizen of

257
00:09:31,509 --> 00:09:29,200
the united states to be an astronaut

258
00:09:34,389 --> 00:09:31,519
with nasa however

259
00:09:37,590 --> 00:09:34,399
most astronauts aren't selected until

260
00:09:39,670 --> 00:09:37,600
their late 20s early 30s at the earliest

261
00:09:41,350 --> 00:09:39,680
usually because of all that education

262
00:09:42,870 --> 00:09:41,360
that i was talking about earlier you

263
00:09:45,030 --> 00:09:42,880

really have to work hard to get up to

264
00:09:47,750 --> 00:09:45,040
that level and the degrees are on in

265
00:09:49,590 --> 00:09:47,760
stem fields but it's a wide range right

266
00:09:51,750 --> 00:09:49,600
absolutely you can really study anything

267
00:09:53,509 --> 00:09:51,760
within the umbrella of stem you know

268
00:09:55,750 --> 00:09:53,519
ranging from the example that we like to

269
00:09:58,310 --> 00:09:55,760
use as veterinary sciences all the way

270
00:10:00,230 --> 00:09:58,320
up to astrophysics anything that you are

271
00:10:01,350 --> 00:10:00,240
passionate about that's really cool all

272
00:10:03,509 --> 00:10:01,360
right well we've got a student

273
00:10:04,870 --> 00:10:03,519
correspondent in the audience ben and

274
00:10:06,389 --> 00:10:04,880
ben do any of you guys have some

275
00:10:08,389 --> 00:10:06,399
questions out there

276
00:10:09,990 --> 00:10:08,399
yeah we do have some questions the first

277
00:10:11,990 --> 00:10:10,000
one is from isaac

278
00:10:15,750 --> 00:10:12,000
can you make food in space

279
00:10:17,590 --> 00:10:15,760
absolutely otherwise how would the

280
00:10:19,509 --> 00:10:17,600
astronauts eat up there

281
00:10:20,710 --> 00:10:19,519
um so there's there's a couple ways we

282
00:10:22,630 --> 00:10:20,720
can look at that you can definitely

283
00:10:25,190 --> 00:10:22,640
prepare food in space that's what we

284
00:10:26,870 --> 00:10:25,200
usually do is we send pre-prepared food

285
00:10:28,710 --> 00:10:26,880
up to space with the astronauts that

286
00:10:30,310 --> 00:10:28,720
they can then consume there but

287
00:10:33,030 --> 00:10:30,320
something that they've recently been

288
00:10:33,990 --> 00:10:33,040

working on as well is growing food in

289
00:10:36,230 --> 00:10:34,000
space

290
00:10:37,990 --> 00:10:36,240
so everything from growing potentially

291
00:10:40,470 --> 00:10:38,000
algae that we could eat because that's a

292
00:10:42,389 --> 00:10:40,480
great source of protein and nutrients

293
00:10:45,430 --> 00:10:42,399
also to growing more normal seeming

294
00:10:47,190 --> 00:10:45,440
things like lettuce so they have grown

295
00:10:48,949 --> 00:10:47,200
and eaten space lettuce on the

296
00:10:50,069 --> 00:10:48,959
international space station and

297
00:10:51,910 --> 00:10:50,079
hopefully that's something that we'll

298
00:10:53,030 --> 00:10:51,920
get to do on the trip to mars as well

299
00:10:55,590 --> 00:10:53,040
and maybe they can grow a little like

300
00:10:57,750 --> 00:10:55,600
space basil and make some space

301
00:10:59,110 --> 00:10:57,760
that would be quite nice yeah all right

302
00:11:03,269 --> 00:10:59,120
then do we have another question in the

303
00:11:04,949 --> 00:11:03,279
audience our next question is from jack

304
00:11:07,190 --> 00:11:04,959
uh how many people work in the

305
00:11:08,069 --> 00:11:07,200
international space station

306
00:11:09,670 --> 00:11:08,079
how many people work on the

307
00:11:11,030 --> 00:11:09,680
international space station yeah so

308
00:11:12,550 --> 00:11:11,040
that's a great question the

309
00:11:15,110 --> 00:11:12,560
international space station has a

310
00:11:17,990 --> 00:11:15,120
capacity they can hold anywhere up to

311
00:11:19,509 --> 00:11:18,000
nine people at a time however the least

312
00:11:21,990 --> 00:11:19,519
amount of people that are usually that

313
00:11:24,550 --> 00:11:22,000

are on there are three usually they

314
00:11:26,470 --> 00:11:24,560
average that out and keep a crew of six

315
00:11:27,350 --> 00:11:26,480
astronauts on the international space

316
00:11:29,430 --> 00:11:27,360
station

317
00:11:31,750 --> 00:11:29,440
something interesting about that is that

318
00:11:34,389 --> 00:11:31,760
i would bet that every single one of you

319
00:11:36,389 --> 00:11:34,399
in the audience has been alive um your

320
00:11:38,790 --> 00:11:36,399
entire life that you've been alive there

321
00:11:40,870 --> 00:11:38,800
has been at least three astronauts on

322
00:11:42,389 --> 00:11:40,880
the international space station that's

323
00:11:43,590 --> 00:11:42,399
kind of a crazy thought isn't it

324
00:11:44,790 --> 00:11:43,600
absolutely amazing because i'm old

325
00:11:47,750 --> 00:11:44,800
enough to remember when that wasn't the

326
00:11:49,910 --> 00:11:47,760
case so am i honestly well i don't quite

327
00:11:51,269 --> 00:11:49,920
remember it but it happened

328
00:11:52,790 --> 00:11:51,279
thanks

329
00:11:55,190 --> 00:11:52,800
all right so we recently got a chance to

330
00:11:56,629 --> 00:11:55,200
talk with astronaut christina cook about

331
00:11:59,110 --> 00:11:56,639
some of the training that she's done to

332
00:12:00,150 --> 00:11:59,120
help prepare for a long duration space

333
00:12:02,230 --> 00:12:00,160
flight

334
00:12:03,990 --> 00:12:02,240
so in my career i've had the chance to

335
00:12:05,990 --> 00:12:04,000
work in antarctica over several

336
00:12:07,910 --> 00:12:06,000
different seasons and i think that's

337
00:12:09,590 --> 00:12:07,920
been really helpful in preparing me for

338
00:12:11,670 --> 00:12:09,600

some of the things i've come across so

339
00:12:13,350 --> 00:12:11,680
far in my training and that i hopefully

340
00:12:15,350 --> 00:12:13,360
will come across on a future mission

341
00:12:17,590 --> 00:12:15,360
assignment and one of those things is

342
00:12:19,350 --> 00:12:17,600
how to work in novel environments when i

343
00:12:21,190 --> 00:12:19,360
was working in the arctic in greenland i

344
00:12:23,430 --> 00:12:21,200
used to have to climb towers in

345
00:12:24,710 --> 00:12:23,440
temperatures of around minus 50 or

346
00:12:26,949 --> 00:12:24,720
something like that

347
00:12:29,269 --> 00:12:26,959
and make repairs to scientific

348
00:12:30,949 --> 00:12:29,279
instruments at the top of these towers

349
00:12:34,150 --> 00:12:30,959
and sometimes those repairs actually

350
00:12:35,829 --> 00:12:34,160
involve soldering and real delicate work

351
00:12:37,750 --> 00:12:35,839
and obviously you have multiple layers

352
00:12:40,150 --> 00:12:37,760
of gloves on so learning how to be

353
00:12:42,310 --> 00:12:40,160
patient and how to get the job done when

354
00:12:44,310 --> 00:12:42,320
you have not a lot of dexterity you're

355
00:12:46,710 --> 00:12:44,320
in an awkward physical

356
00:12:48,870 --> 00:12:46,720
position and you have to have a lot of

357
00:12:50,069 --> 00:12:48,880
focus and overcome some of the things

358
00:12:52,550 --> 00:12:50,079
that might not make you the most

359
00:12:54,550 --> 00:12:52,560
comfortable in that situation it's a lot

360
00:12:56,069 --> 00:12:54,560
like spacewalk training you're in a

361
00:12:57,509 --> 00:12:56,079
space suit and spacewalk training you

362
00:12:59,350 --> 00:12:57,519
have huge pressurized gloves on you

363
00:13:01,430 --> 00:12:59,360

can't actually feel anything

364
00:13:03,750 --> 00:13:01,440
in terms of the dexterity and the touch

365
00:13:05,190 --> 00:13:03,760
sensation on your on your fingers but

366
00:13:07,269 --> 00:13:05,200
you have to still find a way to get the

367
00:13:08,710 --> 00:13:07,279
job done despite all of those things

368
00:13:10,470 --> 00:13:08,720
that aren't comfortable and that might

369
00:13:13,750 --> 00:13:10,480
be trying to distract you from the focus

370
00:13:16,550 --> 00:13:14,870
one of the things that's going to be

371
00:13:19,030 --> 00:13:16,560
really important for a future trip to

372
00:13:21,030 --> 00:13:19,040
mars are space walks and beth has a few

373
00:13:22,790 --> 00:13:21,040
friends helping her and remember submit

374
00:13:23,990 --> 00:13:22,800
questions we will use them later but

375
00:13:26,230 --> 00:13:24,000
right now let's go over to beth and some

376
00:13:28,870 --> 00:13:26,240
spacewalkers

377
00:13:30,629 --> 00:13:28,880
thanks marty uh i am joined by catherine

378
00:13:32,710 --> 00:13:30,639
she is one of the explainers here at the

379
00:13:34,389 --> 00:13:32,720
national air space museum catherine do

380
00:13:36,870 --> 00:13:34,399
you want to tell me what uh explainers

381
00:13:39,189 --> 00:13:36,880
do here for us yeah of course um so the

382
00:13:41,670 --> 00:13:39,199
explainers program is here at uh hazy

383
00:13:43,030 --> 00:13:41,680
and also at our downtown mall building

384
00:13:44,389 --> 00:13:43,040
and we are high school and college

385
00:13:45,430 --> 00:13:44,399
students that are just really interested

386
00:13:46,949 --> 00:13:45,440
in stem

387
00:13:48,949 --> 00:13:46,959
and we have discovery stations and

388
00:13:50,389 --> 00:13:48,959

demonstrations that talk about science

389
00:13:51,670 --> 00:13:50,399
and technology and how they relate to

390
00:13:53,269 --> 00:13:51,680
the artifacts that we have here in the

391
00:13:55,750 --> 00:13:53,279
museum and do you want to introduce your

392
00:13:57,509 --> 00:13:55,760
our uh our guinea pig

393
00:13:59,590 --> 00:13:57,519
friend here

394
00:14:02,069 --> 00:13:59,600
so we have got annika here and she is

395
00:14:03,350 --> 00:14:02,079
going to be simulating a spacewalk so of

396
00:14:04,470 --> 00:14:03,360
course we're not actually in space we're

397
00:14:06,150 --> 00:14:04,480
going to make it seem like she's in

398
00:14:07,829 --> 00:14:06,160
space by having her sit on this wheelie

399
00:14:08,870 --> 00:14:07,839
chair um and not touching the ground at

400
00:14:10,949 --> 00:14:08,880
all so she'll have to be actually

401
00:14:13,269 --> 00:14:10,959
pulling herself along on these rails

402
00:14:15,509 --> 00:14:13,279
here and she is double tethered

403
00:14:17,110 --> 00:14:15,519
onto here she has a camera on her head

404
00:14:18,790 --> 00:14:17,120
just like our astronauts do i mean you

405
00:14:21,829 --> 00:14:18,800
can see what she's looking at right now

406
00:14:23,189 --> 00:14:21,839
so say hi to our camera guys um and um

407
00:14:25,350 --> 00:14:23,199
that's just what we have on our actual

408
00:14:26,550 --> 00:14:25,360
astronauts so that mission control knows

409
00:14:27,910 --> 00:14:26,560
what our astronauts are doing and they

410
00:14:29,910 --> 00:14:27,920
can see

411
00:14:32,550 --> 00:14:29,920
what's going on so what she's going to

412
00:14:33,990 --> 00:14:32,560
do now is move herself down to do a

413
00:14:35,910 --> 00:14:34,000

spacewalk

414
00:14:38,389 --> 00:14:35,920
so she is going to move her tethers

415
00:14:42,710 --> 00:14:38,399
along and

416
00:14:42,720 --> 00:14:47,189
here we go

417
00:14:51,189 --> 00:14:49,269
all right so how's that going pretty

418
00:14:52,949 --> 00:14:51,199
good pretty good yeah

419
00:14:55,590 --> 00:14:52,959
what's pretty what's challenging about

420
00:14:58,389 --> 00:14:55,600
it probably unlocking them unlocking

421
00:15:00,310 --> 00:14:58,399
them yeah so when we have our gloves on

422
00:15:01,430 --> 00:15:00,320
our spacesuits they're pretty thick we

423
00:15:02,470 --> 00:15:01,440
really don't have a lot of mobility in

424
00:15:04,949 --> 00:15:02,480
them but they're actually the thinnest

425
00:15:06,790 --> 00:15:04,959
part of our spacesuit um

426
00:15:08,470 --> 00:15:06,800
but it is a little bit difficult to do

427
00:15:11,990 --> 00:15:08,480
that right um and this is still when

428
00:15:14,470 --> 00:15:12,000
we're here on earth too as well so yeah

429
00:15:16,389 --> 00:15:14,480
one tether at a time exactly yeah so the

430
00:15:18,389 --> 00:15:16,399
double tethering um means that we are

431
00:15:20,870 --> 00:15:18,399
always connected

432
00:15:22,629 --> 00:15:20,880
um all the time so we never float away

433
00:15:24,069 --> 00:15:22,639
in space so what she's going to do now

434
00:15:27,269 --> 00:15:24,079
is get our wrench she's going to screw

435
00:15:30,069 --> 00:15:28,790
and as you're screwing that what's

436
00:15:32,790 --> 00:15:30,079
happening to you

437
00:15:34,949 --> 00:15:32,800
i have to move the thing up and down and

438
00:15:37,269 --> 00:15:34,959

it's also connected to the harness yeah

439
00:15:38,870 --> 00:15:37,279
so the the screws attached to her and if

440
00:15:40,710 --> 00:15:38,880
you don't hold on to the bar what what

441
00:15:42,230 --> 00:15:40,720
were you doing you would float away

442
00:15:43,110 --> 00:15:42,240
you'd flow away right um but because

443
00:15:45,350 --> 00:15:43,120
you're holding on to the bar you could

444
00:15:47,030 --> 00:15:45,360
see a little bit of a bit ago that she

445
00:15:49,670 --> 00:15:47,040
was kind of moving as well so that

446
00:15:51,829 --> 00:15:49,680
torque that she's putting on the screw

447
00:15:52,710 --> 00:15:51,839
is actually causing her to move as well

448
00:15:54,310 --> 00:15:52,720
and that's something that astronauts

449
00:15:55,829 --> 00:15:54,320
have to get used to because here on

450
00:15:56,949 --> 00:15:55,839
earth we don't have that we have gravity

451
00:15:58,550 --> 00:15:56,959
helping us out with that but when we're

452
00:16:00,389 --> 00:15:58,560
floating up in space we're going to move

453
00:16:01,749 --> 00:16:00,399
around a lot more

454
00:16:03,509 --> 00:16:01,759
and we can't really replicate that too

455
00:16:06,310 --> 00:16:03,519
well here on earth are you ready to be

456
00:16:07,670 --> 00:16:06,320
an astronaut no no

457
00:16:10,069 --> 00:16:07,680
need a little bit more training a little

458
00:16:11,910 --> 00:16:10,079
bit more training well we did marty did

459
00:16:14,230 --> 00:16:11,920
actually talk to ann mclean who is an

460
00:16:15,749 --> 00:16:14,240
astronaut who's currently training uh

461
00:16:17,590 --> 00:16:15,759
for an upcoming mission let's see what

462
00:16:19,749 --> 00:16:17,600
ann had to say

463
00:16:20,949 --> 00:16:19,759

i'm joined by nasa astronaut anne mclean

464
00:16:22,230 --> 00:16:20,959
thank you so much for talking with us

465
00:16:23,990 --> 00:16:22,240
today thank you for having me in

466
00:16:26,069 --> 00:16:24,000
becoming an astronaut did you face any

467
00:16:27,430 --> 00:16:26,079
hurdles to get there uh there's lots of

468
00:16:29,110 --> 00:16:27,440
hurdles there's hurdles every day along

469
00:16:30,550 --> 00:16:29,120
the path you know the path to becoming

470
00:16:32,710 --> 00:16:30,560
an astronaut or achieving your dreams no

471
00:16:34,069 --> 00:16:32,720
matter what they are can sometimes be so

472
00:16:37,509 --> 00:16:34,079
long you know really does take a

473
00:16:38,949 --> 00:16:37,519
lifetime and there's small hurdles like

474
00:16:40,389 --> 00:16:38,959
you know you want to make a sports team

475
00:16:42,069 --> 00:16:40,399
and you and you get cut there's big

476
00:16:43,990 --> 00:16:42,079
hurdles like tests that you don't know

477
00:16:45,269 --> 00:16:44,000
if you can pass or that you know

478
00:16:47,030 --> 00:16:45,279
subjects that you don't understand

479
00:16:48,629 --> 00:16:47,040
there's hurdles every day but the trick

480
00:16:50,389 --> 00:16:48,639
is just to keep going

481
00:16:52,629 --> 00:16:50,399
now you're in training

482
00:16:54,629 --> 00:16:52,639
to eventually go into space what's that

483
00:16:55,749 --> 00:16:54,639
training like uh the training is really

484
00:16:57,350 --> 00:16:55,759
interesting it's something different

485
00:16:59,030 --> 00:16:57,360
every single day one of the most

486
00:17:00,949 --> 00:16:59,040
important things to being an astronaut

487
00:17:03,269 --> 00:17:00,959
that i've learned is versatility you

488
00:17:04,949 --> 00:17:03,279

know one day i might be speaking russian

489
00:17:06,630 --> 00:17:04,959
you know learning a foreign language uh

490
00:17:08,230 --> 00:17:06,640
the next time i might be doing science

491
00:17:11,110 --> 00:17:08,240
experiments in a lab and learning how to

492
00:17:12,870 --> 00:17:11,120
pipette and sequence dna uh and then i'm

493
00:17:15,110 --> 00:17:12,880
flying a t-38 jet or i'm getting in the

494
00:17:17,350 --> 00:17:15,120
suit and doing a a space walk you know

495
00:17:19,029 --> 00:17:17,360
in the pool a training space walk and uh

496
00:17:20,470 --> 00:17:19,039
so we just have to be ready for

497
00:17:22,390 --> 00:17:20,480
something different every single day and

498
00:17:24,230 --> 00:17:22,400
being able to shift gears

499
00:17:25,429 --> 00:17:24,240
you're a very experienced pilot but from

500
00:17:26,789 --> 00:17:25,439
what you said earlier it sounds very

501
00:17:28,789 --> 00:17:26,799
much like you're also training to be a

502
00:17:29,830 --> 00:17:28,799
scientist as well we're training to be

503
00:17:31,669 --> 00:17:29,840
everything you know what's really

504
00:17:33,590 --> 00:17:31,679
interesting my class got there in 2013

505
00:17:35,590 --> 00:17:33,600
we came from all different backgrounds

506
00:17:37,190 --> 00:17:35,600
and uh we always say our background

507
00:17:38,950 --> 00:17:37,200
helps us in about five percent of what

508
00:17:40,789 --> 00:17:38,960
we need to do and the other 95 we're

509
00:17:42,230 --> 00:17:40,799
learning from scratch and what's really

510
00:17:43,590 --> 00:17:42,240
cool about that is we can rely on each

511
00:17:45,830 --> 00:17:43,600
other so when i went into a lab and

512
00:17:48,230 --> 00:17:45,840
learned biology i got to rely on jessica

513
00:17:49,669 --> 00:17:48,240

mear who has a phd in you know and she's

514
00:17:51,110 --> 00:17:49,679
she's done experiments all over the

515
00:17:52,870 --> 00:17:51,120
world and you know that's her bread and

516
00:17:54,470 --> 00:17:52,880
butter and so being able to rely on

517
00:17:56,630 --> 00:17:54,480
those experts and then you know we go

518
00:17:58,630 --> 00:17:56,640
over and we fly and i get to help her

519
00:18:00,070 --> 00:17:58,640
out and so it's uh and that's kind of

520
00:18:01,990 --> 00:18:00,080
really we learn to depend on each other

521
00:18:03,510 --> 00:18:02,000
and each other's expertise

522
00:18:04,870 --> 00:18:03,520
that's really cool thank you so much for

523
00:18:07,430 --> 00:18:04,880
talking with us today sure thank you for

524
00:18:11,350 --> 00:18:10,150
abby what do you know about coding yeah

525
00:18:13,430 --> 00:18:11,360
i actually have a little bit of

526
00:18:16,230 --> 00:18:13,440
experience with coding i recently

527
00:18:18,710 --> 00:18:16,240
learned both scilab and python which are

528
00:18:21,590 --> 00:18:18,720
two different languages of coding that

529
00:18:24,390 --> 00:18:21,600
are often used in physics and biology

530
00:18:26,470 --> 00:18:24,400
and i also know that coding is pretty

531
00:18:28,549 --> 00:18:26,480
important for space exploration

532
00:18:30,150 --> 00:18:28,559
absolutely so beth has got a couple more

533
00:18:32,630 --> 00:18:30,160
friends and they are working on a coding

534
00:18:33,909 --> 00:18:32,640
activity beth how's it going well uh

535
00:18:35,110 --> 00:18:33,919
we're going to start on a coding

536
00:18:36,950 --> 00:18:35,120
activity we're going to do a little

537
00:18:39,830 --> 00:18:36,960
computer coding now i know this doesn't

538
00:18:40,870 --> 00:18:39,840

look like computer coding at all

539
00:18:43,029 --> 00:18:40,880
catherine do you want to tell us a

540
00:18:45,350 --> 00:18:43,039
little bit what we're doing with this

541
00:18:47,029 --> 00:18:45,360
piece of rope and wire and beads yeah so

542
00:18:49,350 --> 00:18:47,039
we've got some beads on here and how

543
00:18:50,789 --> 00:18:49,360
coding works is it uses binary um and

544
00:18:52,710 --> 00:18:50,799
that is going to be a series of ones and

545
00:18:54,150 --> 00:18:52,720
zeros put in different orders um and so

546
00:18:55,750 --> 00:18:54,160
what we're going to be doing is our

547
00:18:56,950 --> 00:18:55,760
initials with these beads here there's

548
00:18:58,630 --> 00:18:56,960
eight beads of each of our three

549
00:19:00,710 --> 00:18:58,640
different colors um and so we're going

550
00:19:02,870 --> 00:19:00,720
to just figure out the right order of

551
00:19:04,470 --> 00:19:02,880
the ones and zeros to put them in um so

552
00:19:05,270 --> 00:19:04,480
that we can kind of code our names on

553
00:19:08,870 --> 00:19:05,280
there

554
00:19:11,990 --> 00:19:08,880
our initials so each so for this the

555
00:19:13,350 --> 00:19:12,000
wire if it's a zero goes on the outside

556
00:19:16,470 --> 00:19:13,360
on the outside

557
00:19:18,230 --> 00:19:16,480
and if it's a one it goes on the inside

558
00:19:20,150 --> 00:19:18,240
and you can look at these characters

559
00:19:28,070 --> 00:19:20,160
what's your first initial

560
00:19:32,310 --> 00:19:30,070
marty we're going to get to work on this

561
00:19:34,630 --> 00:19:32,320
uh how about you and abby tell us what

562
00:19:36,310 --> 00:19:34,640
this has to do with the space program if

563
00:19:39,270 --> 00:19:36,320

it's a zero

564
00:19:41,669 --> 00:19:39,280
oh sorry about that so

565
00:19:43,110 --> 00:19:41,679
yes the the coding has a long history in

566
00:19:44,630 --> 00:19:43,120
the space program and it goes all the

567
00:19:47,029 --> 00:19:44,640
way back to the beginning of the space

568
00:19:49,909 --> 00:19:47,039
program and the apollo 11 the first

569
00:19:51,669 --> 00:19:49,919
mission to land on the moon and in fact

570
00:19:54,549 --> 00:19:51,679
there was an amazing woman by the name

571
00:19:57,029 --> 00:19:54,559
of margaret hamilton margaret was known

572
00:19:58,710 --> 00:19:57,039
as the rope mother because her team

573
00:20:01,430 --> 00:19:58,720
wrote the software code and then

574
00:20:03,190 --> 00:20:01,440
programmed the guidance computer the way

575
00:20:05,430 --> 00:20:03,200
they programmed the computer was with

576
00:20:06,789 --> 00:20:05,440
metal beads and wire

577
00:20:09,110 --> 00:20:06,799
they could send a signal through the

578
00:20:10,470 --> 00:20:09,120
wire which would recognize it as a one

579
00:20:13,029 --> 00:20:10,480
or a zero and that's how they were able

580
00:20:15,590 --> 00:20:13,039
to get the the code into that computer

581
00:20:17,430 --> 00:20:15,600
now here's the crazy thing that selfie

582
00:20:19,350 --> 00:20:17,440
that we just took

583
00:20:21,190 --> 00:20:19,360
the memory that that takes up on my

584
00:20:23,990 --> 00:20:21,200
camera or when you guys take a selfie

585
00:20:26,789 --> 00:20:24,000
that selfie takes up 20 times more

586
00:20:28,549 --> 00:20:26,799
memory than the entire guidance computer

587
00:20:31,430 --> 00:20:28,559
for apollo 11 that got us to the moon

588
00:20:33,909 --> 00:20:31,440

for the first time 20 times more that

589
00:20:35,270 --> 00:20:33,919
blows me away blows me away also i i

590
00:20:37,110 --> 00:20:35,280
happen to know that i probably have a

591
00:20:39,350 --> 00:20:37,120
couple hundred selfies on my phone and

592
00:20:41,669 --> 00:20:39,360
i'm sure that most of you do as well so

593
00:20:44,310 --> 00:20:41,679
the question is why aren't we on mars

594
00:20:45,430 --> 00:20:44,320
yet i know i know let's go check back in

595
00:20:46,630 --> 00:20:45,440
with beth and see how the coding is

596
00:20:55,669 --> 00:20:46,640
going

597
00:20:57,510 --> 00:20:55,679
fine fine good doing your initials okay

598
00:20:58,950 --> 00:20:57,520
now let me ask you this

599
00:21:02,390 --> 00:20:58,960
uh the apollo

600
00:21:03,430 --> 00:21:02,400
program the computer code was 72

601
00:21:05,430 --> 00:21:03,440
000

602
00:21:06,230 --> 00:21:05,440
bytes do you want to do 72 thousands of

603
00:21:08,630 --> 00:21:06,240
these

604
00:21:09,990 --> 00:21:08,640
not really no okay what if you made a

605
00:21:11,029 --> 00:21:10,000
mistake you'd have to go back and find

606
00:21:13,990 --> 00:21:11,039
it would you want to go back and find a

607
00:21:16,149 --> 00:21:14,000
mistake like no no okay well marty i

608
00:21:17,830 --> 00:21:16,159
think that we're okay doing our initials

609
00:21:20,789 --> 00:21:17,840
but probably

610
00:21:22,870 --> 00:21:20,799
not uh coding for the apollo program uh

611
00:21:24,950 --> 00:21:22,880
we're gonna keep working on this uh

612
00:21:26,630 --> 00:21:24,960
sending it back to you and abby awesome

613
00:21:28,390 --> 00:21:26,640

nice job guys abby are you ready for a

614
00:21:31,029 --> 00:21:28,400
few more questions always ready all

615
00:21:33,909 --> 00:21:31,039
right let's start with a video question

616
00:21:36,070 --> 00:21:33,919
hi my name is austin and i was wondering

617
00:21:37,350 --> 00:21:36,080
how i can become an astronaut and go to

618
00:21:38,870 --> 00:21:37,360
mars

619
00:21:40,710 --> 00:21:38,880
how does austin become an astronaut and

620
00:21:42,630 --> 00:21:40,720
go to mars yeah that's a great question

621
00:21:44,310 --> 00:21:42,640
that austin has so the first thing is

622
00:21:46,710 --> 00:21:44,320
that austin is definitely in the right

623
00:21:48,870 --> 00:21:46,720
age range so everyone from austin's

624
00:21:50,870 --> 00:21:48,880
range so you know middle schoolers right

625
00:21:52,630 --> 00:21:50,880
now all the way up even to college

626
00:21:54,870 --> 00:21:52,640
students like me are within that age

627
00:21:57,990 --> 00:21:54,880
range where you know we're going to mars

628
00:22:00,710 --> 00:21:58,000
it's happening in mid-2030s but in order

629
00:22:03,270 --> 00:22:00,720
for austin to do that he needs to focus

630
00:22:05,110 --> 00:22:03,280
really hard on his education so he needs

631
00:22:07,190 --> 00:22:05,120
to get an undergraduate degree and then

632
00:22:09,909 --> 00:22:07,200
a master's degree and then probably also

633
00:22:12,310 --> 00:22:09,919
a phd degree in a stem field so that

634
00:22:13,990 --> 00:22:12,320
science technology engineering or math

635
00:22:15,909 --> 00:22:14,000
awesome and i know austin really also

636
00:22:18,470 --> 00:22:15,919
wants to know how he can send his sister

637
00:22:19,830 --> 00:22:18,480
to mars any advice on that you know i

638
00:22:22,630 --> 00:22:19,840

don't really know but austin should

639
00:22:24,630 --> 00:22:22,640
probably talk to my older sister who for

640
00:22:27,190 --> 00:22:24,640
a long time has been the president of

641
00:22:30,230 --> 00:22:27,200
the get abby to mars club

642
00:22:32,789 --> 00:22:30,240
which might be because she supports me

643
00:22:35,909 --> 00:22:32,799
as family or it might be that she just

644
00:22:38,390 --> 00:22:35,919
really wants me far away um i like to

645
00:22:39,990 --> 00:22:38,400
think it's the first one i think so i

646
00:22:41,510 --> 00:22:40,000
think so all right let's go to an online

647
00:22:43,270 --> 00:22:41,520
question

648
00:22:44,789 --> 00:22:43,280
do men and women have an equal chance of

649
00:22:47,190 --> 00:22:44,799
getting into the program

650
00:22:49,990 --> 00:22:47,200
that's something that i'm excited to say

651
00:22:51,909 --> 00:22:50,000
now yes this most recent astronaut

652
00:22:54,789 --> 00:22:51,919
selection in which eight astronauts were

653
00:22:56,789 --> 00:22:54,799
chosen four of them were men and four of

654
00:22:58,870 --> 00:22:56,799
them were women so i hope that in the

655
00:23:00,549 --> 00:22:58,880
future as i start to become an astronaut

656
00:23:02,470 --> 00:23:00,559
and as maybe some of these young folk

657
00:23:05,029 --> 00:23:02,480
become an astronaut as well we'll get to

658
00:23:06,470 --> 00:23:05,039
see that same balance occurring nice all

659
00:23:08,070 --> 00:23:06,480
right ben do we have any more audience

660
00:23:11,669 --> 00:23:08,080
questions

661
00:23:13,990 --> 00:23:11,679
yeah our next question is from ben

662
00:23:15,590 --> 00:23:14,000
hello uh what is your motivation to

663
00:23:17,270 --> 00:23:15,600

become an astronaut

664
00:23:19,270 --> 00:23:17,280
what's your motivation

665
00:23:20,789 --> 00:23:19,280
that's a great question so

666
00:23:23,029 --> 00:23:20,799
for me it's been something that i've

667
00:23:24,470 --> 00:23:23,039
been passionate about since as long as i

668
00:23:26,470 --> 00:23:24,480
can remember honestly since i was

669
00:23:28,390 --> 00:23:26,480
probably four or five years old i was

670
00:23:29,750 --> 00:23:28,400
really into science fiction and i

671
00:23:31,750 --> 00:23:29,760
actually thought that i was going to be

672
00:23:35,029 --> 00:23:31,760
an astro navigator

673
00:23:37,110 --> 00:23:35,039
and then when i was about nine years old

674
00:23:39,430 --> 00:23:37,120
probably i realized that that wasn't a

675
00:23:41,350 --> 00:23:39,440
real position and so i settled for

676
00:23:42,390 --> 00:23:41,360
astronaut instead but it's just

677
00:23:44,470 --> 00:23:42,400
something that i've always been

678
00:23:46,950 --> 00:23:44,480
passionate about with this idea of you

679
00:23:48,950 --> 00:23:46,960
know going somewhere new looking over

680
00:23:51,110 --> 00:23:48,960
that next hill crossing that next

681
00:23:53,430 --> 00:23:51,120
boundary and seeing what else is out

682
00:23:54,870 --> 00:23:53,440
there so for me that's what motivates me

683
00:23:55,990 --> 00:23:54,880
nice all right ben do we have any more

684
00:23:59,029 --> 00:23:56,000
questions

685
00:24:01,110 --> 00:23:59,039
um we also have a question from erica

686
00:24:03,350 --> 00:24:01,120
um did you always want to train to be an

687
00:24:05,190 --> 00:24:03,360
astronaut ever since you were little

688
00:24:07,269 --> 00:24:05,200

yeah honestly for as long as i can

689
00:24:08,230 --> 00:24:07,279
remember i've wanted to be an astronaut

690
00:24:10,310 --> 00:24:08,240
um

691
00:24:11,909 --> 00:24:10,320
you know i've entertained other career

692
00:24:14,950 --> 00:24:11,919
options but that's the great part about

693
00:24:16,870 --> 00:24:14,960
being an astronaut is that it is not the

694
00:24:19,190 --> 00:24:16,880
end-all be-all of a person's life it's

695
00:24:20,789 --> 00:24:19,200
actually just a small portion of it so

696
00:24:22,390 --> 00:24:20,799
you have to be something before you're

697
00:24:23,990 --> 00:24:22,400
an astronaut and you have to be

698
00:24:25,830 --> 00:24:24,000
something after you're an astronaut as

699
00:24:28,789 --> 00:24:25,840
well so that means that i can be a

700
00:24:31,110 --> 00:24:28,799
biologist and a mathematician or a

701
00:24:33,510 --> 00:24:31,120
physicist or anything else as well as

702
00:24:35,830 --> 00:24:33,520
being an astronaut so for me it was

703
00:24:36,950 --> 00:24:35,840
always something that was you know there

704
00:24:38,549 --> 00:24:36,960
all right let's go back to an audience

705
00:24:39,510 --> 00:24:38,559
question

706
00:24:42,230 --> 00:24:39,520
then

707
00:24:43,990 --> 00:24:42,240
um we have a question from millie

708
00:24:46,070 --> 00:24:44,000
how long does it take to train to be an

709
00:24:48,549 --> 00:24:46,080
astronaut yes that's also a great

710
00:24:50,549 --> 00:24:48,559
question once an astronaut is selected

711
00:24:52,630 --> 00:24:50,559
for a specific mission they can train

712
00:24:54,470 --> 00:24:52,640
anywhere from a year and a half to two

713
00:24:56,710 --> 00:24:54,480

and a half years for that mission

714
00:24:59,269 --> 00:24:56,720
however that's usually for a six-month

715
00:25:01,350 --> 00:24:59,279
mission so for a three-year mission to

716
00:25:03,110 --> 00:25:01,360
mars the training period might be a

717
00:25:04,710 --> 00:25:03,120
little bit longer than that

718
00:25:07,110 --> 00:25:04,720
all right well we've talked about some

719
00:25:09,190 --> 00:25:07,120
uh some female astronauts today but

720
00:25:10,870 --> 00:25:09,200
there are a lot of other females paving

721
00:25:13,350 --> 00:25:10,880
the way to mars many of these are

722
00:25:15,430 --> 00:25:13,360
working behind the scenes

723
00:25:17,590 --> 00:25:15,440
including veteran space flight engineer

724
00:25:19,669 --> 00:25:17,600
charlie blackwell thompson who will be

725
00:25:22,070 --> 00:25:19,679
the first woman to oversee a nasa

726
00:25:24,070 --> 00:25:22,080
liftoff and launch team nasa engineer

727
00:25:25,990 --> 00:25:24,080
miley chain is contributing to the mars

728
00:25:27,909 --> 00:25:26,000
mission by helping us understand how

729
00:25:31,029 --> 00:25:27,919
humans collaborate with robots and

730
00:25:33,269 --> 00:25:31,039
automation and julie williams byrd is an

731
00:25:35,669 --> 00:25:33,279
electro optics engineer helping to

732
00:25:38,230 --> 00:25:35,679
identify technologies that enable human

733
00:25:40,470 --> 00:25:38,240
spaceflight that is an absolutely

734
00:25:42,390 --> 00:25:40,480
incredible list of women

735
00:25:44,070 --> 00:25:42,400
well we're out of time abby thank you so

736
00:25:46,230 --> 00:25:44,080
much for joining us today yeah thanks

737
00:25:48,390 --> 00:25:46,240
for having me on it was a blast

738
00:25:49,990 --> 00:25:48,400

i love that um i can't wait to see where

739
00:25:51,990 --> 00:25:50,000
your journey takes you over the next

740
00:25:54,950 --> 00:25:52,000
five ten years that's that's gonna be a

741
00:25:57,029 --> 00:25:54,960
lot of fun to follow along with that um

742
00:25:59,269 --> 00:25:57,039
we'd like to also thank uh explainer

743
00:26:01,430 --> 00:25:59,279
catherine and our sponsor nasa for for

744
00:26:03,350 --> 00:26:01,440
the show today and we want to encourage

745
00:26:05,990 --> 00:26:03,360
everybody to tune in in two weeks when

746
00:26:07,909 --> 00:26:06,000
we talk about world war one 100 years

747
00:26:09,590 --> 00:26:07,919
ago this month the united states entered

748
00:26:11,269 --> 00:26:09,600
world war one and in two weeks we'll be

749
00:26:13,190 --> 00:26:11,279
heading to the residence of the belgian

750
00:26:15,190 --> 00:26:13,200
ambassador to talk all about it check it

751
00:26:17,430 --> 00:26:15,200
out i'm at the national world war one

752
00:26:20,230 --> 00:26:17,440
museum in kansas city missouri and check

753
00:26:23,110 --> 00:26:20,240
this out

754
00:26:24,789 --> 00:26:23,120
this is a field of nine thousand poppies

755
00:26:27,350 --> 00:26:24,799
each one representing a thousand

756
00:26:29,029 --> 00:26:27,360
soldiers killed during world war one

757
00:26:31,269 --> 00:26:29,039
what influence do you think world war

758
00:26:33,510 --> 00:26:31,279
one had on science technology

759
00:26:35,269 --> 00:26:33,520
engineering the arts and math if you

760
00:26:43,590 --> 00:26:35,279
want to learn more about world war one

761
00:26:47,590 --> 00:26:45,190
so today we are going to leave you with

762
00:26:50,470 --> 00:26:47,600
an animation of the sights and sounds of

763
00:26:52,789 --> 00:26:50,480

an sls rocket launch this may be the

764
00:26:55,430 --> 00:26:52,799
rocket that takes christina or ann or

765
00:26:57,510 --> 00:26:55,440
abby or maybe even one of you all in the

766
00:27:10,630 --> 00:26:57,520
outer space and to mars thanks for

767
00:27:10,640 --> 00:27:21,909
is