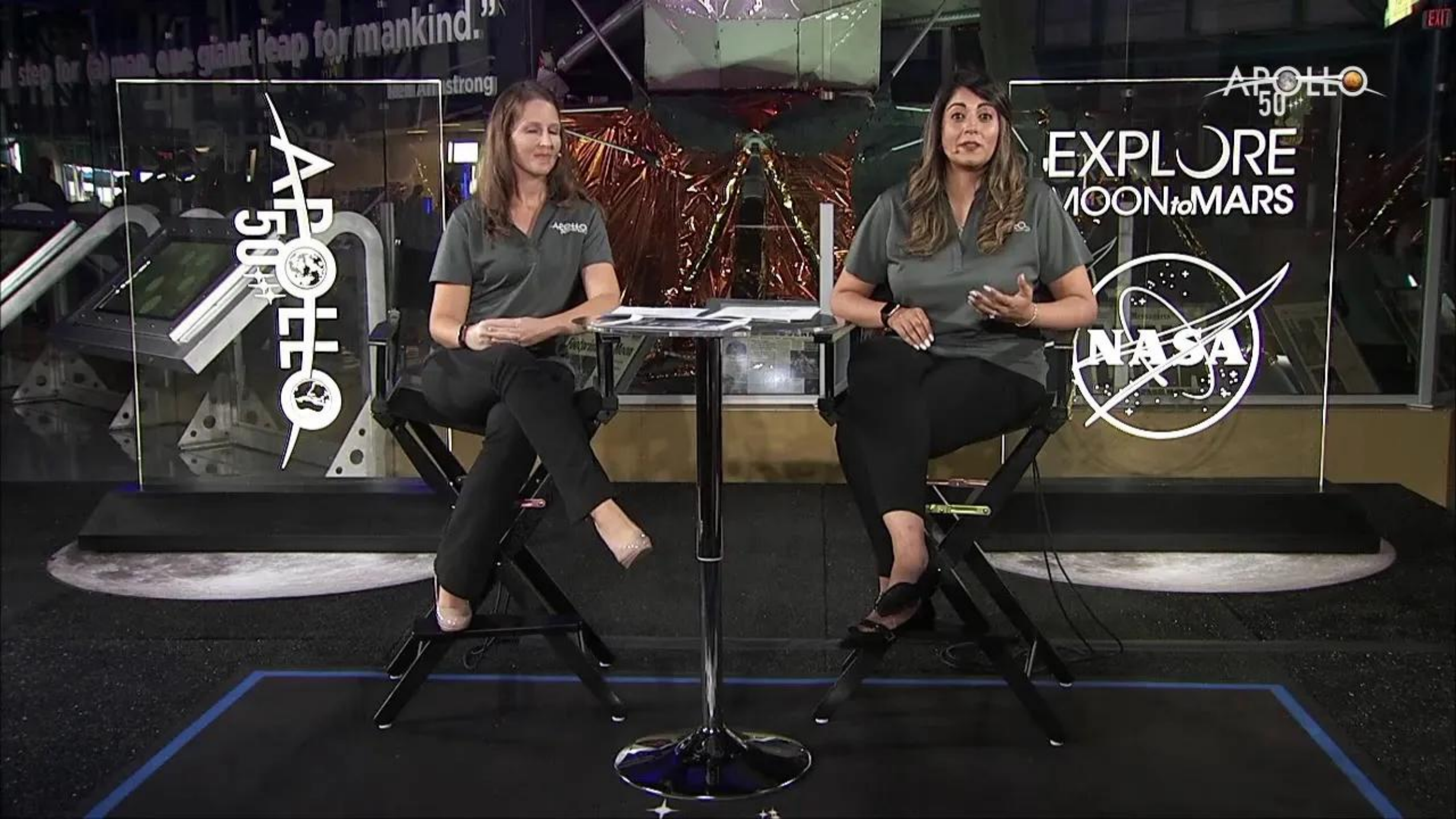
APOLLO 50
EXPLORE
MOON to MARS
NASA

1
00:06:33,240 --> 00:06:44,870
[Music]

2
00:06:50,309 --> 00:06:48,150
we've been there before

3
00:06:52,629 --> 00:06:50,319
we're going again

4
00:06:54,710 --> 00:06:52,639
this time to stay

5
00:06:55,830 --> 00:06:54,720
visionaries and dreamers imagine the

6
00:06:59,110 --> 00:06:55,840
future

7
00:07:02,469 --> 00:06:59,120
engineers and scientists build it

8
00:07:04,309 --> 00:07:02,479
using math and science as forms of art

9
00:07:06,390 --> 00:07:04,319
creating technologies

10
00:07:10,230 --> 00:07:06,400
transforming societies

11
00:07:12,950 --> 00:07:10,240
now we take civilization to the stars

12
00:07:14,309 --> 00:07:12,960
on a journey to explore and build

13
00:07:16,390 --> 00:07:14,319

a gateway

14
00:07:18,560 --> 00:07:16,400
an outpost

15
00:07:23,510 --> 00:07:18,570
the future

16
00:07:28,550 --> 00:07:25,830
good afternoon and welcome to our show

17
00:07:30,950 --> 00:07:28,560
stem forge the moon we're live from the

18
00:07:32,950 --> 00:07:30,960
apollo saturn 5 center at nasa's kennedy

19
00:07:34,710 --> 00:07:32,960
space center in florida where we just

20
00:07:36,870 --> 00:07:34,720
wrapped up a two-hour celebration

21
00:07:38,790 --> 00:07:36,880
commemorating the 50th anniversary of

22
00:07:41,189 --> 00:07:38,800
the first ever walk on the surface of

23
00:07:43,990 --> 00:07:41,199
the moon we turn now to the future of

24
00:07:46,710 --> 00:07:44,000
space exploration to you the students

25
00:07:49,029 --> 00:07:46,720
and educators thanks for joining us and

26
00:07:51,189 --> 00:07:49,039
welcome to our show i'm stephanie martin

27
00:07:53,029 --> 00:07:51,199
from nasa's office of communications and

28
00:07:55,589 --> 00:07:53,039
i'm here with my co-host and friend

29
00:07:56,710 --> 00:07:55,599
nilofer ramji from nasa's office of stem

30
00:07:59,110 --> 00:07:56,720
engagement

31
00:08:01,430 --> 00:07:59,120
we are part of the artemis generation of

32
00:08:04,070 --> 00:08:01,440
explorers we're going back to the moon

33
00:08:06,230 --> 00:08:04,080
and this time to stay we just saw the

34
00:08:08,390 --> 00:08:06,240
new artemis branding which is truly a

35
00:08:11,189 --> 00:08:08,400
nod to the apollo missions what many

36
00:08:13,830 --> 00:08:11,199
people don't know is apollo had a twin

37
00:08:15,029 --> 00:08:13,840
she was a woman named artemis goddess of

38
00:08:17,909 --> 00:08:15,039

the moon

39
00:08:20,070 --> 00:08:17,919
as the artemis generation we need to

40
00:08:22,469 --> 00:08:20,080
develop the skills to get us to the moon

41
00:08:25,189 --> 00:08:22,479
and beyond nasa's office of stem

42
00:08:27,909 --> 00:08:25,199
engagement works with educators schools

43
00:08:30,070 --> 00:08:27,919
and other organizations like museums to

44
00:08:32,790 --> 00:08:30,080
immerse students in nasa's work and

45
00:08:35,269 --> 00:08:32,800
enhance literacy in science technology

46
00:08:37,909 --> 00:08:35,279
engineering and math generally we're

47
00:08:38,870 --> 00:08:37,919
here to inspire the next generation to

48
00:08:41,269 --> 00:08:38,880
explore

49
00:08:42,790 --> 00:08:41,279
coming up we'll see an artemis mission

50
00:08:45,509 --> 00:08:42,800
through the eyes of middle school

51
00:08:47,430 --> 00:08:45,519
students from museums across the country

52
00:08:49,509 --> 00:08:47,440
we'll also see those same students

53
00:08:53,269 --> 00:08:49,519
perform experiments that show how you

54
00:08:54,470 --> 00:08:53,279
can recreate them from your home using

55
00:08:55,350 --> 00:08:54,480
things that you can find around the

56
00:08:57,030 --> 00:08:55,360
house

57
00:08:59,670 --> 00:08:57,040
later in the show we'll also have a

58
00:09:01,910 --> 00:08:59,680
message from a special celebrity guest

59
00:09:04,630 --> 00:09:01,920
we want everyone to join the forward to

60
00:09:07,269 --> 00:09:04,640
the moon conversation using the hashtag

61
00:09:09,350 --> 00:09:07,279
nasastem on twitter my team is standing

62
00:09:11,670 --> 00:09:09,360
by to answer your questions on social

63
00:09:14,150 --> 00:09:11,680

media i hope you join our conversation

64
00:09:16,150 --> 00:09:14,160
online let's get started

65
00:09:17,910 --> 00:09:16,160
as stephanie mentioned i caught up with

66
00:09:19,829 --> 00:09:17,920
middle school students across the

67
00:09:23,030 --> 00:09:19,839
country this summer who use their

68
00:09:24,630 --> 00:09:23,040
imagination to see what it would

69
00:09:27,110 --> 00:09:24,640
what it would be like if they took over

70
00:09:29,670 --> 00:09:27,120
an artemis moon mission they simulated a

71
00:09:31,509 --> 00:09:29,680
launch arrived at the lunar gateway took

72
00:09:33,910 --> 00:09:31,519
their first steps on the moon and even

73
00:09:35,910 --> 00:09:33,920
collected samples on the lunar surface

74
00:09:40,560 --> 00:09:35,920
first up we'll take you inside mission

75
00:09:44,630 --> 00:09:42,630
[Music]

76
00:09:46,550 --> 00:09:44,640
welcome to the space launch artemis 3

77
00:09:48,230 --> 00:09:46,560
crew you have been training many months

78
00:09:50,470 --> 00:09:48,240
for the greatest adventure of your whole

79
00:09:52,710 --> 00:09:50,480
life i know you're a little bit nervous

80
00:09:54,630 --> 00:09:52,720
but that is normal you will be exploring

81
00:09:56,949 --> 00:09:54,640
our solar system beginning with the moon

82
00:09:59,990 --> 00:09:56,959
and eventually onto mars

83
00:10:02,630 --> 00:10:00,000
when you hear the words go for launch

84
00:10:04,630 --> 00:10:02,640
all systems will be a go t minus three

85
00:10:07,190 --> 00:10:04,640
minutes and counting i think it's

86
00:10:09,750 --> 00:10:07,200
important for nasa to send people to the

87
00:10:12,310 --> 00:10:09,760
moon and to mars because they can do

88
00:10:14,870 --> 00:10:12,320

experiments to help people back on earth

89
00:10:16,630 --> 00:10:14,880
what excites me about artemis is that

90
00:10:19,110 --> 00:10:16,640
it's going to have the first woman on

91
00:10:20,710 --> 00:10:19,120
the moon and there hasn't been one

92
00:10:22,870 --> 00:10:20,720
before and that's really cool all right

93
00:10:25,110 --> 00:10:22,880
we're through you are go to watch main

94
00:10:26,069 --> 00:10:25,120
engine start 10

95
00:10:27,030 --> 00:10:26,079
9

96
00:10:27,910 --> 00:10:27,040
8

97
00:10:28,949 --> 00:10:27,920
7

98
00:10:29,910 --> 00:10:28,959
6

99
00:10:30,949 --> 00:10:29,920
5

100
00:10:31,910 --> 00:10:30,959
4

101
00:10:32,710 --> 00:10:31,920
three

102
00:10:35,190 --> 00:10:32,720
two

103
00:10:38,069 --> 00:10:35,200
one solid rockets is your ignition and

104
00:10:39,829 --> 00:10:38,079
lifts off hardness is clear the tower

105
00:10:41,509 --> 00:10:39,839
welcome to the solar system artemis

106
00:10:43,430 --> 00:10:41,519
three you just passed the international

107
00:10:45,670 --> 00:10:43,440
space station and should see the lunar

108
00:10:47,990 --> 00:10:45,680
gateway and moon in the distance soon

109
00:10:50,790 --> 00:10:48,000
navigator fire rockets on lunar orbit

110
00:10:52,870 --> 00:10:50,800
insertion now thank you capcom we will

111
00:10:55,190 --> 00:10:52,880
check in as we near gateway and are

112
00:10:57,670 --> 00:10:55,200
getting ready to dock at astra this is

113
00:11:08,150 --> 00:10:57,680

one step closer to a future where better

114
00:11:14,230 --> 00:11:10,069
so here at kennedy space center we have

115
00:11:16,230 --> 00:11:14,240
launch complex 39 that is where pad 39a

116
00:11:17,990 --> 00:11:16,240
and 39b were used for the apollo

117
00:11:19,110 --> 00:11:18,000
missions and are key to the future

118
00:11:21,590 --> 00:11:19,120
exploration

119
00:11:24,150 --> 00:11:21,600
of uh human spaceflight

120
00:11:25,509 --> 00:11:24,160
pad 39a is where spacex will launch our

121
00:11:27,430 --> 00:11:25,519
astronauts in the future to the

122
00:11:29,030 --> 00:11:27,440
international space station and you can

123
00:11:29,910 --> 00:11:29,040
see that on the left hand side of your

124
00:11:31,990 --> 00:11:29,920
screen

125
00:11:34,310 --> 00:11:32,000
pad 39b is on the right and that is

126
00:11:36,790 --> 00:11:34,320
where our heavy lift rocket known as the

127
00:11:39,030 --> 00:11:36,800
space launch system will carry the orion

128
00:11:42,069 --> 00:11:39,040
spacecraft for artemis missions to the

129
00:11:44,150 --> 00:11:42,079
moon and on to mars we've been hearing a

130
00:11:46,069 --> 00:11:44,160
lot about artemis today stephanie can

131
00:11:47,829 --> 00:11:46,079
you tell us a little more to really

132
00:11:49,750 --> 00:11:47,839
simplify it our apollo missions were

133
00:11:51,910 --> 00:11:49,760
focused on getting astronauts safely to

134
00:11:53,350 --> 00:11:51,920
and from the moon for artemis we're

135
00:11:55,670 --> 00:11:53,360
going to send our astronauts back to the

136
00:11:57,269 --> 00:11:55,680
moon and there they will explore and

137
00:11:59,910 --> 00:11:57,279
they will utilize that experience to

138
00:12:01,990 --> 00:11:59,920

prepare us to take the next giant leap

139
00:12:03,910 --> 00:12:02,000
to send our astronauts to mars and

140
00:12:06,069 --> 00:12:03,920
artemis will require a heavy lift

141
00:12:08,470 --> 00:12:06,079
vehicle the space launch system the

142
00:12:10,550 --> 00:12:08,480
students we met at the cosmosphere also

143
00:12:12,710 --> 00:12:10,560
conducted an experiment using balloons

144
00:12:15,190 --> 00:12:12,720
as air-powered rockets to launch the

145
00:12:17,269 --> 00:12:15,200
largest payload possible this science

146
00:12:19,590 --> 00:12:17,279
activity teaches students what it takes

147
00:12:21,350 --> 00:12:19,600
to launch a payload into orbit and even

148
00:12:28,470 --> 00:12:21,360
how slight variations in weight can

149
00:12:31,670 --> 00:12:29,910
here with me we have melissa from the

150
00:12:32,790 --> 00:12:31,680
cosmosphere in hutchinson kansas and

151
00:12:34,710 --> 00:12:32,800
she's going to talk to us about an

152
00:12:37,750 --> 00:12:34,720
activity these guys are doing yes

153
00:12:41,190 --> 00:12:37,760
they're doing the nasa activity heavy

154
00:12:43,990 --> 00:12:41,200
lifting it is a payload activity to test

155
00:12:46,629 --> 00:12:44,000
the amount of payload they can

156
00:12:49,990 --> 00:12:46,639
evenly distribute and how to distribute

157
00:12:53,829 --> 00:12:50,000
it onto their rocket ship each paper

158
00:12:55,110 --> 00:12:53,839
clip is equal to two grams of weight

159
00:12:57,750 --> 00:12:55,120
and their

160
00:12:59,190 --> 00:12:57,760
challenge is to get as many paper clips

161
00:13:01,910 --> 00:12:59,200
onto the

162
00:13:04,150 --> 00:13:01,920
rocket as possible and be able to reach

163
00:13:07,269 --> 00:13:04,160

the ceiling you just need an elongated

164
00:13:09,670 --> 00:13:07,279
balloon some paper clips a clothes pin

165
00:13:11,190 --> 00:13:09,680
to stop the airflow and some masking

166
00:13:13,030 --> 00:13:11,200
tapes all right so why don't we check

167
00:13:15,030 --> 00:13:13,040
out what we have going on on this side

168
00:13:17,430 --> 00:13:15,040
it looks like drew and emma over here

169
00:13:20,629 --> 00:13:17,440
have some of their activity started

170
00:13:21,670 --> 00:13:20,639
yes drew drew has a strategy where he's

171
00:13:24,389 --> 00:13:21,680
going to

172
00:13:27,269 --> 00:13:24,399
condense up his payload into a into a

173
00:13:29,670 --> 00:13:27,279
baggie and distribute it onto the rocket

174
00:13:32,949 --> 00:13:29,680
and experiment with the best location to

175
00:13:35,590 --> 00:13:32,959
put his payload for the maximum height

176
00:13:38,710 --> 00:13:35,600
and emma it has a different strategy

177
00:13:41,509 --> 00:13:38,720
where she is chaining the paper clips

178
00:13:43,910 --> 00:13:41,519
and uh will evenly distribute them onto

179
00:13:46,389 --> 00:13:43,920
and tape them onto her rocket

180
00:13:48,629 --> 00:13:46,399
to maximize her payload and and the

181
00:13:51,110 --> 00:13:48,639
height of her rocket right and then the

182
00:13:53,189 --> 00:13:51,120
idea is to test the different payloads

183
00:13:55,430 --> 00:13:53,199
to see what happens or which one

184
00:13:57,670 --> 00:13:55,440
launches exactly so they're going to

185
00:14:00,069 --> 00:13:57,680
start with a very light payload and

186
00:14:03,430 --> 00:14:00,079
they'll increase their tests each time

187
00:14:05,590 --> 00:14:03,440
by a few grams until they maximize their

188
00:14:07,509 --> 00:14:05,600

payload excellent so why don't we see

189
00:14:09,910 --> 00:14:07,519
what it looks like to launch this thing

190
00:14:11,910 --> 00:14:09,920
so it looks like madeline and david have

191
00:14:14,069 --> 00:14:11,920
finished their products

192
00:14:16,629 --> 00:14:14,079
yes we have a couple different design

193
00:14:18,710 --> 00:14:16,639
ideas one is to keep the payload

194
00:14:21,750 --> 00:14:18,720
together and at the bottom

195
00:14:24,389 --> 00:14:21,760
and then the other design is to

196
00:14:26,069 --> 00:14:24,399
change the payload and distribute the

197
00:14:28,870 --> 00:14:26,079
weight all the way down the length of

198
00:14:31,110 --> 00:14:28,880
the rocket okay very nice so are we able

199
00:14:32,870 --> 00:14:31,120
to watch one of these get launched sure

200
00:14:34,550 --> 00:14:32,880
okay let's try it out

201
00:14:37,829 --> 00:14:34,560
all right okay so we're gonna launch

202
00:14:43,110 --> 00:14:37,839
ready is everyone counting three

203
00:14:43,120 --> 00:14:45,590
that's one

204
00:14:49,430 --> 00:14:47,030
so why don't we try this with another

205
00:14:51,509 --> 00:14:49,440
payload all right so madeline and her

206
00:14:53,590 --> 00:14:51,519
partner have put an additional paper

207
00:14:54,949 --> 00:14:53,600
clip onto this balloon i'm really

208
00:14:56,500 --> 00:14:54,959
excited to see what happens with this

209
00:15:06,949 --> 00:14:56,510
one are you guys excited

210
00:15:10,069 --> 00:15:08,230
so for those of you who would like to

211
00:15:11,509 --> 00:15:10,079
try this activity at home please feel

212
00:15:12,790 --> 00:15:11,519
free to visit the website at the bottom

213
00:15:14,230 --> 00:15:12,800

of the screen and you're more than

214
00:15:18,069 --> 00:15:14,240
welcome to partake in this really

215
00:15:21,910 --> 00:15:19,910
the heavy lift experiment and many

216
00:15:24,389 --> 00:15:21,920
others are in our stem forge of the moon

217
00:15:26,310 --> 00:15:24,399
activity guide parents educators and

218
00:15:28,470 --> 00:15:26,320
students can go to the website and

219
00:15:30,710 --> 00:15:28,480
download the book there is a ton of

220
00:15:32,470 --> 00:15:30,720
really fun kitchen science in there i

221
00:15:34,470 --> 00:15:32,480
had a lot of fun with them myself in

222
00:15:36,550 --> 00:15:34,480
fact the water filtration activity you

223
00:15:38,949 --> 00:15:36,560
will see coming up was my favorite and

224
00:15:41,350 --> 00:15:38,959
stephanie all of these activities can be

225
00:15:43,590 --> 00:15:41,360
done at home using the activity guide

226
00:15:46,150 --> 00:15:43,600
from launching to living on the moon

227
00:15:48,310 --> 00:15:46,160
there's a lot to learn

228
00:15:50,230 --> 00:15:48,320
museums across the country are hosting

229
00:15:51,990 --> 00:15:50,240
watch parties just like the one that is

230
00:15:54,710 --> 00:15:52,000
in national in the national mall in

231
00:15:56,790 --> 00:15:54,720
washington d.c it was coordinated by

232
00:15:59,430 --> 00:15:56,800
nasa and the smithsonian's air and space

233
00:16:00,790 --> 00:15:59,440
museum here you can see uh the monument

234
00:16:03,590 --> 00:16:00,800
in the background with all of the

235
00:16:05,430 --> 00:16:03,600
exhibits along both sides many of them

236
00:16:07,110 --> 00:16:05,440
have big events that are being hosted

237
00:16:09,110 --> 00:16:07,120
even tomorrow to commemorate the big

238
00:16:11,590 --> 00:16:09,120

239
00:16:14,150 --> 00:16:11,600
and each night this week an image of a

240
00:16:16,389 --> 00:16:14,160
saturn v rocket was being projected onto

241
00:16:18,069 --> 00:16:16,399
the side of the washington monument and

242
00:16:20,949 --> 00:16:18,079
starting tonight and tomorrow a

243
00:16:22,949 --> 00:16:20,959
17-minute animated show will tell the

244
00:16:25,110 --> 00:16:22,959
story of the launch and landing of

245
00:16:27,590 --> 00:16:25,120
apollo 11. that's happening at the

246
00:16:29,110 --> 00:16:27,600
national mall in washington dc if you're

247
00:16:30,710 --> 00:16:29,120
in the nation's capital this week it

248
00:16:32,949 --> 00:16:30,720
sounds like something really worth

249
00:16:35,269 --> 00:16:32,959
seeing it really does as you can see

250
00:16:37,430 --> 00:16:35,279
with that that rocket on the pad as it's

251
00:16:40,069 --> 00:16:37,440
displayed on the monument it's just

252
00:16:41,670 --> 00:16:40,079
amazing i i wish i was in dc if i wasn't

253
00:16:43,990 --> 00:16:41,680
actually able to be here with all of you

254
00:16:45,829 --> 00:16:44,000
today exactly and despite the heat index

255
00:16:48,790 --> 00:16:45,839
it would have been a great adventure it

256
00:16:50,389 --> 00:16:48,800
sure would have so a few moments ago we

257
00:16:52,069 --> 00:16:50,399
saw a mission simulation at the

258
00:16:54,310 --> 00:16:52,079
cosmosphere where we had students

259
00:16:56,629 --> 00:16:54,320
actually in a mission simulator i'm

260
00:16:58,470 --> 00:16:56,639
amazed how interactive these museums are

261
00:17:00,790 --> 00:16:58,480
right and it's so great to have these

262
00:17:02,710 --> 00:17:00,800
experiences available to the students

263
00:17:05,350 --> 00:17:02,720

nasa partnerships are crucial in

264
00:17:06,710 --> 00:17:05,360
engaging students in nasa's mission not

265
00:17:08,949 --> 00:17:06,720
only do they provide learning

266
00:17:11,350 --> 00:17:08,959
opportunities for students they also

267
00:17:13,829 --> 00:17:11,360
enhance the capabilities of educational

268
00:17:15,669 --> 00:17:13,839
institutions and support educators to

269
00:17:17,429 --> 00:17:15,679
better engage the students at the

270
00:17:19,429 --> 00:17:17,439
columbia memorial space center in

271
00:17:21,750 --> 00:17:19,439
california for example students can

272
00:17:23,189 --> 00:17:21,760
return to the moon or voyage to mars and

273
00:17:25,429 --> 00:17:23,199
their interactive space mission

274
00:17:27,110 --> 00:17:25,439
simulator they're a challenger learning

275
00:17:29,350 --> 00:17:27,120
center where students can experience the

276
00:17:31,029 --> 00:17:29,360
journey of exploration and teamwork

277
00:17:33,350 --> 00:17:31,039
exactly and students there took their

278
00:17:34,870 --> 00:17:33,360
imagination to new heights as they

279
00:17:37,029 --> 00:17:34,880
thought through what it might be like to

280
00:17:38,870 --> 00:17:37,039
be aboard the lunar gateway the station

281
00:17:41,029 --> 00:17:38,880
that will orbit the moon and become a

282
00:17:41,990 --> 00:17:41,039
rest stop as we travel further to mars

283
00:17:43,669 --> 00:17:42,000
someday

284
00:17:45,510 --> 00:17:43,679
i was there with our camera crew as

285
00:17:47,909 --> 00:17:45,520
these middle schoolers prepared to land

286
00:17:53,029 --> 00:17:47,919
on the moon they had a lot of fun let's

287
00:17:57,990 --> 00:17:55,270
gateway tracking your orbit how do you

288
00:18:00,549 --> 00:17:58,000

read for landing

289
00:18:02,870 --> 00:18:00,559
mission control orbit established for

290
00:18:05,029 --> 00:18:02,880
landing on the moon's south pole i think

291
00:18:08,150 --> 00:18:05,039
it's important to send people to the

292
00:18:10,070 --> 00:18:08,160
moon and onto mars because discovery is

293
00:18:12,549 --> 00:18:10,080
a big thing and

294
00:18:16,070 --> 00:18:12,559
the more you explore the more you know

295
00:18:18,630 --> 00:18:16,080
initiating system checks on lunar lander

296
00:18:20,870 --> 00:18:18,640
power systems power systems go

297
00:18:22,710 --> 00:18:20,880
communications comms

298
00:18:24,390 --> 00:18:22,720
go i've always wanted to go to the moon

299
00:18:26,390 --> 00:18:24,400
i wanted to be one of the first women on

300
00:18:28,870 --> 00:18:26,400
the moon i wanted to be first so that

301
00:18:31,430 --> 00:18:28,880
kind of be like a big dream come true

302
00:18:33,590 --> 00:18:31,440
that we're going back during my time

303
00:18:36,230 --> 00:18:33,600
environmental controls environment

304
00:18:38,470 --> 00:18:36,240
controls go i think the most important

305
00:18:41,350 --> 00:18:38,480
experiment to do on the moon would most

306
00:18:43,990 --> 00:18:41,360
likely be seeing if we could find some

307
00:18:45,350 --> 00:18:44,000
way to make people able to live on there

308
00:18:47,590 --> 00:18:45,360
it's going to be the first woman to go

309
00:18:49,190 --> 00:18:47,600
on and it's showing just how much things

310
00:18:51,750 --> 00:18:49,200
have changed since the first landing on

311
00:18:52,630 --> 00:18:51,760
the moon flight systems flight systems

312
00:18:54,710 --> 00:18:52,640
go

313
00:18:57,590 --> 00:18:54,720

landis systems responding with green

314
00:19:00,390 --> 00:18:57,600
across the board confirm houston

315
00:19:03,110 --> 00:19:00,400
confirmed gateway lander systems green

316
00:19:05,430 --> 00:19:03,120
proceed with descent operations

317
00:19:08,390 --> 00:19:05,440
roger mission control proceeding with

318
00:19:11,430 --> 00:19:08,400
descent operations what excites me the

319
00:19:12,230 --> 00:19:11,440
most about going forward to the moon

320
00:19:14,950 --> 00:19:12,240
is

321
00:19:17,590 --> 00:19:14,960
like creating a whole new life and being

322
00:19:20,070 --> 00:19:17,600
able to discover more than we thought

323
00:19:22,470 --> 00:19:20,080
luna expedition seats is secured

324
00:19:25,110 --> 00:19:22,480
expedition team moving to lander

325
00:19:27,110 --> 00:19:25,120
what excites me the most about um going

326
00:19:29,830 --> 00:19:27,120
forward to the moon is the learning

327
00:19:32,630 --> 00:19:29,840
opportunity i think it's amazing that

328
00:19:34,870 --> 00:19:32,640
during my lifetime and during like

329
00:19:37,110 --> 00:19:34,880
especially me at this age i'll be able

330
00:19:39,669 --> 00:19:37,120
to experience something like this

331
00:19:41,750 --> 00:19:39,679
expedition team has entered the lander

332
00:19:43,669 --> 00:19:41,760
hatch is secure

333
00:19:46,549 --> 00:19:43,679
pressure check on lander

334
00:19:48,470 --> 00:19:46,559
pressure good holding nominal

335
00:19:49,990 --> 00:19:48,480
initiating release

336
00:19:52,470 --> 00:19:50,000
seals released

337
00:19:54,230 --> 00:19:52,480
lander backing away

338
00:19:56,150 --> 00:19:54,240

two meters

339
00:19:57,510 --> 00:19:56,160
four meters

340
00:20:00,390 --> 00:19:57,520
six meters

341
00:20:03,510 --> 00:20:00,400
you are clear expedition lander godspeed

342
00:20:07,190 --> 00:20:03,520
chloe and lenora safe travels expedition

343
00:20:09,190 --> 00:20:07,200
and don't forget our souvenirs

344
00:20:11,110 --> 00:20:09,200
the lunar gateway that these young women

345
00:20:12,390 --> 00:20:11,120
just shared with us it is such a

346
00:20:14,230 --> 00:20:12,400
different approach from what we had

347
00:20:16,390 --> 00:20:14,240
during apollo that's right stephanie

348
00:20:18,470 --> 00:20:16,400
it's a huge innovation gateway gives us

349
00:20:20,710 --> 00:20:18,480
the opportunity to land anywhere on the

350
00:20:22,470 --> 00:20:20,720
surface of the moon it will also be a

351
00:20:25,029 --> 00:20:22,480
rest stop and staging area as we

352
00:20:27,510 --> 00:20:25,039
continue to go on to mars now a journey

353
00:20:29,909 --> 00:20:27,520
to the moon takes about three days each

354
00:20:32,310 --> 00:20:29,919
way and a great way to pass the time is

355
00:20:34,630 --> 00:20:32,320
with music stephanie music has actually

356
00:20:36,630 --> 00:20:34,640
been part of space travel from the

357
00:20:38,870 --> 00:20:36,640
beginning right it really has there were

358
00:20:41,350 --> 00:20:38,880
pre-launch songs shuttle crew wake-up

359
00:20:42,789 --> 00:20:41,360
songs and some astronauts he even played

360
00:20:44,950 --> 00:20:42,799
instruments on the international space

361
00:20:47,029 --> 00:20:44,960
station to bring a part of home to the

362
00:20:49,669 --> 00:20:47,039
space station with them with nasa

363
00:20:51,830 --> 00:20:49,679

returning to the moon by 2024 we asked

364
00:20:53,830 --> 00:20:51,840
people what they thought should be on

365
00:20:56,070 --> 00:20:53,840
the playlist for the journey and created

366
00:20:58,870 --> 00:20:56,080
moon tunes you can listen on third rock

367
00:21:00,549 --> 00:20:58,880
radio or use the hashtag nasa moontunes

368
00:21:02,390 --> 00:21:00,559
to learn more

369
00:21:05,029 --> 00:21:02,400
one of the tunes that made the playlist

370
00:21:07,190 --> 00:21:05,039
is the song moon in the water by dawes

371
00:21:09,029 --> 00:21:07,200
but for our astronauts when they travel

372
00:21:10,710 --> 00:21:09,039
to the moon one important aspect is

373
00:21:13,590 --> 00:21:10,720
going to be making sure they have clean

374
00:21:15,029 --> 00:21:13,600
water on the moon nova you recently

375
00:21:16,710 --> 00:21:15,039
worked with students on a water

376
00:21:19,190 --> 00:21:16,720
filtration experiment

377
00:21:20,789 --> 00:21:19,200
that's right i did this activity gets

378
00:21:23,029 --> 00:21:20,799
students thinking about some of the

379
00:21:25,350 --> 00:21:23,039
necessities of survival when it comes to

380
00:21:27,110 --> 00:21:25,360
living and working in space in this case

381
00:21:28,870 --> 00:21:27,120
we looked at some of the science behind

382
00:21:30,870 --> 00:21:28,880
cleaning water

383
00:21:32,630 --> 00:21:30,880
and creating a water filtration system

384
00:21:36,390 --> 00:21:32,640
let's go back to the columbia memorial

385
00:21:39,270 --> 00:21:37,750
we're with brianna at the columbia

386
00:21:40,470 --> 00:21:39,280
memorial space center and today we're

387
00:21:43,350 --> 00:21:40,480
going to be doing a cleaning water

388
00:21:45,830 --> 00:21:43,360

activity yeah so cleaning water is so

389
00:21:47,669 --> 00:21:45,840
important right so i thought you know we

390
00:21:49,750 --> 00:21:47,679
can make a water filter activity and

391
00:21:52,070 --> 00:21:49,760
just really get the importance of water

392
00:21:53,190 --> 00:21:52,080
and why we need clean water exactly and

393
00:21:54,870 --> 00:21:53,200
as the astronauts say on the

394
00:21:57,430 --> 00:21:54,880
international space station

395
00:22:00,390 --> 00:21:57,440
tomorrow's coffee was yesterday's coffee

396
00:22:03,029 --> 00:22:00,400
gotta recycle everything we can exactly

397
00:22:04,789 --> 00:22:03,039
so right here i have some necessary

398
00:22:07,190 --> 00:22:04,799
materials that we do for the filter

399
00:22:09,510 --> 00:22:07,200
great i have some beans different kind

400
00:22:12,310 --> 00:22:09,520
of beans some aquarium gravel because

401
00:22:15,270 --> 00:22:12,320
it's very colorful i have some peas and

402
00:22:17,350 --> 00:22:15,280
also rice and our favorite cotton balls

403
00:22:20,390 --> 00:22:17,360
excellent also just to organize some

404
00:22:22,950 --> 00:22:20,400
things i have uh you know a filter to

405
00:22:26,549 --> 00:22:22,960
filter it through some goggles safety

406
00:22:29,430 --> 00:22:26,559
first exactly and also i got some ph

407
00:22:31,430 --> 00:22:29,440
papers so we can actually see if our

408
00:22:33,110 --> 00:22:31,440
water is filtered awesome so we have

409
00:22:34,149 --> 00:22:33,120
jackie and nevaeh continuing the

410
00:22:35,750 --> 00:22:34,159
activity

411
00:22:38,149 --> 00:22:35,760
yeah so it looks like they've already

412
00:22:41,669 --> 00:22:38,159
started their filter they have colorful

413
00:22:43,750 --> 00:22:41,679

yeah they have beans green peas surprise

414
00:22:45,190 --> 00:22:43,760
aquarium gravel and it looks like

415
00:22:47,110 --> 00:22:45,200
they're going to add their final step

416
00:22:49,430 --> 00:22:47,120
which is cotton balls it looks like oh

417
00:22:51,510 --> 00:22:49,440
excellent yeah it's really easy and for

418
00:22:53,510 --> 00:22:51,520
our dirty water that we made we actually

419
00:22:55,270 --> 00:22:53,520
used italian dressing which i think is

420
00:22:57,190 --> 00:22:55,280
really fun that's really awesome so you

421
00:22:59,830 --> 00:22:57,200
what you did was you mixed water with

422
00:23:01,830 --> 00:22:59,840
the italian dressing it's that easy wow

423
00:23:03,750 --> 00:23:01,840
okay other times i like to just go

424
00:23:05,510 --> 00:23:03,760
outside and grab some dirt

425
00:23:07,430 --> 00:23:05,520
that's even more fun i love it i love

426
00:23:09,110 --> 00:23:07,440
playing with dirt

427
00:23:11,350 --> 00:23:09,120
and it kind of gives a real feel it's

428
00:23:12,549 --> 00:23:11,360
real dirty water and they get to test it

429
00:23:14,070 --> 00:23:12,559
out and see if it's going to be clean

430
00:23:15,669 --> 00:23:14,080
and when astronauts are on the lunar

431
00:23:17,590 --> 00:23:15,679
gateway they're going to need systems

432
00:23:20,149 --> 00:23:17,600
like this to be even more efficient

433
00:23:22,390 --> 00:23:20,159
heavy-duty systems it looks like we have

434
00:23:24,310 --> 00:23:22,400
a completed activity here

435
00:23:27,430 --> 00:23:24,320
yeah so it looks like everything is

436
00:23:29,510 --> 00:23:27,440
ready to go great and the goggles are on

437
00:23:31,430 --> 00:23:29,520
so safety first i'm glad that they're

438
00:23:33,750 --> 00:23:31,440

ready for that so now all they need to

439
00:23:35,590 --> 00:23:33,760
do is just add the dirty water excellent

440
00:23:37,270 --> 00:23:35,600
and that water doesn't look

441
00:23:41,350 --> 00:23:37,280
too dirty to me i think we need to give

442
00:23:46,149 --> 00:23:43,269
oh there we go look at that dirty water

443
00:23:50,070 --> 00:23:46,159
so he's mixing the italian dressing in

444
00:23:53,990 --> 00:23:52,549
so now i would probably say it's good to

445
00:23:59,190 --> 00:23:54,000
try out so we're going to try this out

446
00:24:04,950 --> 00:24:01,029
i'm hoping it works i hope so too

447
00:24:08,950 --> 00:24:07,269
oh wow it's starting to go through it's

448
00:24:11,830 --> 00:24:08,960
going through all the layers that's

449
00:24:14,070 --> 00:24:11,840
faster than i would expect totally

450
00:24:16,470 --> 00:24:14,080
and i'm actually really surprised it

451
00:24:18,390 --> 00:24:16,480
looks very clean it looks very clean for

452
00:24:20,789 --> 00:24:18,400
those of you interested in participating

453
00:24:22,390 --> 00:24:20,799
in this activity and many others feel

454
00:24:24,870 --> 00:24:22,400
free to visit the website at the bottom

455
00:24:30,870 --> 00:24:24,880
of our screen and take part in this

456
00:24:33,909 --> 00:24:32,789
nellifer the water looks a little

457
00:24:35,669 --> 00:24:33,919
cleaner when it comes out of the

458
00:24:38,549 --> 00:24:35,679
filtration system on the international

459
00:24:40,789 --> 00:24:38,559
space station that is true stephanie our

460
00:24:42,470 --> 00:24:40,799
system includes a couple of technologies

461
00:24:44,630 --> 00:24:42,480
that you don't normally have at home

462
00:24:47,110 --> 00:24:44,640
which is why we suggest students don't

463
00:24:48,070 --> 00:24:47,120

drink the water you filter absolutely

464
00:24:49,750 --> 00:24:48,080
not

465
00:24:52,710 --> 00:24:49,760
now we want stem discoveries and

466
00:24:54,630 --> 00:24:52,720
experiments to be exciting for everyone

467
00:24:57,029 --> 00:24:54,640
we do and even celebrities are getting

468
00:24:59,350 --> 00:24:57,039
excited about nasa's stem activities

469
00:25:01,029 --> 00:24:59,360
actress and singer kiki palmer recently

470
00:25:02,710 --> 00:25:01,039
had the opportunity to learn more about

471
00:25:04,870 --> 00:25:02,720
our initiatives and she shared this

472
00:25:06,789 --> 00:25:04,880
message about stem and nasa's artemis

473
00:25:09,029 --> 00:25:06,799
missions

474
00:25:10,870 --> 00:25:09,039
hey kiki palmer here and when i'm not on

475
00:25:12,630 --> 00:25:10,880
set or in the recording studio one of my

476
00:25:14,549 --> 00:25:12,640
favorite things to do is to learn more

477
00:25:16,230 --> 00:25:14,559
about organizations like nasa and what

478
00:25:18,230 --> 00:25:16,240
they're doing to push the boundaries of

479
00:25:20,149 --> 00:25:18,240
how we understand the world around us in

480
00:25:22,549 --> 00:25:20,159
addition tons of new inventures are on

481
00:25:24,549 --> 00:25:22,559
the horizon including artemis nasa's

482
00:25:26,549 --> 00:25:24,559
mission to land the first woman and next

483
00:25:28,630 --> 00:25:26,559
man on the moon there's never been a

484
00:25:31,190 --> 00:25:28,640
better time to get involved in science

485
00:25:33,669 --> 00:25:31,200
technology engineering or math visit

486
00:25:35,909 --> 00:25:33,679
nasa.gov stem to learn more about how to

487
00:25:42,470 --> 00:25:35,919
help nasa get to the moon mars and

488
00:25:46,390 --> 00:25:44,710

the landing of apollo 11 is what we are

489
00:25:49,669 --> 00:25:46,400
commemorating today

490
00:25:50,390 --> 00:25:49,679
and for the first time when we land um

491
00:25:51,990 --> 00:25:50,400
our

492
00:25:54,070 --> 00:25:52,000
first sorry when we land the first

493
00:25:55,830 --> 00:25:54,080
artemis mission everyone around the

494
00:25:56,950 --> 00:25:55,840
world is going to be celebrating and

495
00:25:58,310 --> 00:25:56,960
it's really going to be something we can

496
00:26:00,070 --> 00:25:58,320
all look forward to

497
00:26:01,669 --> 00:26:00,080
now nellifer you recently had a trip to

498
00:26:03,590 --> 00:26:01,679
the st louis science center i did we

499
00:26:05,350 --> 00:26:03,600
went to the st louis science center and

500
00:26:06,870 --> 00:26:05,360
talked to several students there we

501
00:26:09,430 --> 00:26:06,880
asked them what they thought it would be

502
00:26:11,269 --> 00:26:09,440
like to land on the moon and showed us

503
00:26:12,789 --> 00:26:11,279
what they imagined the big event would

504
00:26:15,029 --> 00:26:12,799
be would be like they were really

505
00:26:17,190 --> 00:26:15,039
excited they got really into it and i

506
00:26:20,149 --> 00:26:17,200
could see our future astronaut class in

507
00:26:24,470 --> 00:26:22,549
artemis this is houston mission control

508
00:26:26,310 --> 00:26:24,480
here you have 30 seconds of fuel

509
00:26:28,310 --> 00:26:26,320
remaining we are close

510
00:26:30,950 --> 00:26:28,320
drifting forward a little

511
00:26:33,909 --> 00:26:30,960
shut down okay engine stop

512
00:26:36,950 --> 00:26:33,919
we copy you down artemis engine is off

513
00:26:38,870 --> 00:26:36,960

south pull here artemis has landed roger

514
00:26:41,110 --> 00:26:38,880
we copy you on the ground welcome to the

515
00:26:43,990 --> 00:26:41,120
moon artemis you're looking good i would

516
00:26:45,830 --> 00:26:44,000
get my classmates excited about artemis

517
00:26:48,070 --> 00:26:45,840
by telling them how we're gonna go to

518
00:26:50,230 --> 00:26:48,080
the moon and i just think that's really

519
00:26:52,470 --> 00:26:50,240
cool it's very important for nasa to

520
00:26:53,510 --> 00:26:52,480
send people to the moon and mars so that

521
00:26:56,390 --> 00:26:53,520
we can

522
00:27:00,149 --> 00:26:56,400
learn more about our planets in our

523
00:27:02,789 --> 00:27:00,159
solar system and we can have new people

524
00:27:04,710 --> 00:27:02,799
go and experience that we see you

525
00:27:07,269 --> 00:27:04,720
opening up the hatch getting ready to

526
00:27:09,269 --> 00:27:07,279
take your first steps

527
00:27:11,909 --> 00:27:09,279
the most important experiment to do on

528
00:27:12,710 --> 00:27:11,919
the moon in my opinion would definitely

529
00:27:16,070 --> 00:27:12,720
be

530
00:27:17,909 --> 00:27:16,080
look at ice on the moon and see if there

531
00:27:20,870 --> 00:27:17,919
are any signs of anything ever living

532
00:27:22,870 --> 00:27:20,880
there artemis welcome to the moon as we

533
00:27:24,950 --> 00:27:22,880
establish a permanent presence we are

534
00:27:28,380 --> 00:27:24,960
closer to sending the next generation of

535
00:27:32,710 --> 00:27:28,390
explorers to mars this is houston out

536
00:27:34,549 --> 00:27:32,720
[Music]

537
00:27:36,630 --> 00:27:34,559
the museum of flight in seattle is

538
00:27:38,470 --> 00:27:36,640

celebrating the landing of apollo 11

539
00:27:40,870 --> 00:27:38,480
mission with a lunar block party for all

540
00:27:43,350 --> 00:27:40,880
museum guests this weekend the museum of

541
00:27:45,510 --> 00:27:43,360
flight also hosts the apollo 11 command

542
00:27:47,669 --> 00:27:45,520
module known as columbia which is on

543
00:27:50,310 --> 00:27:47,679
display for the guests you see gathered

544
00:27:52,789 --> 00:27:50,320
when living in space shelter is vital

545
00:27:54,789 --> 00:27:52,799
for survival conducting experiments and

546
00:27:56,950 --> 00:27:54,799
to have a place to rest when surrounded

547
00:27:58,549 --> 00:27:56,960
by harsh conditions of space and at the

548
00:28:00,310 --> 00:27:58,559
st louis science center students

549
00:28:02,470 --> 00:28:00,320
explored what it would take to build a

550
00:28:04,950 --> 00:28:02,480
habitat that could be sustainable for

551
00:28:09,590 --> 00:28:04,960
astronauts to stay in but also practical

552
00:28:12,950 --> 00:28:11,510
we're here today at the st louis science

553
00:28:14,070 --> 00:28:12,960
center and i'm here with erin who's

554
00:28:16,230 --> 00:28:14,080
going to be showing us a little bit

555
00:28:17,990 --> 00:28:16,240
about a habitat activity erin that's

556
00:28:19,750 --> 00:28:18,000
right our astronauts have just gotten

557
00:28:21,669 --> 00:28:19,760
back from the moon and they are already

558
00:28:23,350 --> 00:28:21,679
designing their next lunar habitats they

559
00:28:26,230 --> 00:28:23,360
are busy at work

560
00:28:29,190 --> 00:28:26,240
drawing a what they think would be

561
00:28:31,190 --> 00:28:29,200
helpful in a habitat to live if they

562
00:28:32,950 --> 00:28:31,200
were on the moon great i can't wait to

563
00:28:34,950 --> 00:28:32,960

see what a habitat looks like so i've

564
00:28:37,750 --> 00:28:34,960
got evan and nikki here and they are

565
00:28:39,190 --> 00:28:37,760
working on actually building a 3d

566
00:28:40,630 --> 00:28:39,200
version of their habits and look at this

567
00:28:42,630 --> 00:28:40,640
behavior it looks like they've scrounged

568
00:28:44,549 --> 00:28:42,640
around the house and found everything in

569
00:28:47,110 --> 00:28:44,559
the recycling bin they have everything

570
00:28:50,149 --> 00:28:47,120
here has been recycled or reused anybody

571
00:28:51,830 --> 00:28:50,159
could do this at home or school anywhere

572
00:28:53,510 --> 00:28:51,840
habitats are so important because we

573
00:28:55,430 --> 00:28:53,520
need astronauts to have clean drinking

574
00:28:57,110 --> 00:28:55,440
water and clean air to breathe yes

575
00:29:00,230 --> 00:28:57,120
there's all kinds of different issues in

576
00:29:02,070 --> 00:29:00,240
space what you said gravity is an issue

577
00:29:04,389 --> 00:29:02,080
and nicki over here to the laboratory

578
00:29:06,630 --> 00:29:04,399
how amazing is this mad scientist space

579
00:29:09,029 --> 00:29:06,640
lab so he came up with a lot of ways to

580
00:29:10,630 --> 00:29:09,039
bring those experiments safely back all

581
00:29:13,110 --> 00:29:10,640
right i want to see a completed habitat

582
00:29:14,549 --> 00:29:13,120
erin let's do it hi samaya can you tell

583
00:29:18,710 --> 00:29:14,559
us a little bit about what you built for

584
00:29:21,430 --> 00:29:18,720
us today yes i built the bedroom and so

585
00:29:24,789 --> 00:29:21,440
in the bedrooms when you come in there's

586
00:29:27,750 --> 00:29:24,799
a button on and off button so if you

587
00:29:30,710 --> 00:29:27,760
want the

588
00:29:32,389 --> 00:29:30,720

gravity gravity on you press the green

589
00:29:33,750 --> 00:29:32,399
button and if you want it off you press

590
00:29:35,830 --> 00:29:33,760
the red button

591
00:29:39,669 --> 00:29:35,840
and then there's a bed

592
00:29:42,470 --> 00:29:39,679
like a roll out bed with a dresser wow

593
00:29:45,269 --> 00:29:42,480
so what do we have going on with dylan

594
00:29:46,389 --> 00:29:45,279
um well i built the kitchen of the

595
00:29:47,669 --> 00:29:46,399
habitat

596
00:29:50,310 --> 00:29:47,679
and um

597
00:29:52,470 --> 00:29:50,320
there is a table right here with chairs

598
00:29:54,710 --> 00:29:52,480
that you can push under the table so

599
00:29:56,230 --> 00:29:54,720
that way it saves more space

600
00:29:58,070 --> 00:29:56,240
and then

601
00:30:00,549 --> 00:29:58,080
it's just the basic stuff like the sink

602
00:30:02,389 --> 00:30:00,559
but then there's a hot water tank inside

603
00:30:04,389 --> 00:30:02,399
of the refrigerator

604
00:30:06,950 --> 00:30:04,399
to keep more water

605
00:30:08,470 --> 00:30:06,960
inside the habitat and there's a pantry

606
00:30:10,470 --> 00:30:08,480
on the side over here wow you thought of

607
00:30:11,430 --> 00:30:10,480
everything katie what do you got going

608
00:30:12,149 --> 00:30:11,440
on

609
00:30:15,669 --> 00:30:12,159
i

610
00:30:18,149 --> 00:30:15,679
the gym

611
00:30:20,470 --> 00:30:18,159
i thought when you come home from outer

612
00:30:23,909 --> 00:30:20,480
space you would want to relax

613
00:30:27,029 --> 00:30:23,919

so we have a tv and couch

614
00:30:29,269 --> 00:30:27,039
and a little bookcase with

615
00:30:31,350 --> 00:30:29,279
some chairs you can sit in and you have

616
00:30:33,990 --> 00:30:31,360
a treadmill you also have some oxygen

617
00:30:35,669 --> 00:30:34,000
and nitrogen and a computer and what's

618
00:30:37,669 --> 00:30:35,679
in the middle of your living room

619
00:30:40,310 --> 00:30:37,679
because i really like this

620
00:30:42,310 --> 00:30:40,320
it's a gravity button that you can push

621
00:30:44,310 --> 00:30:42,320
on and off if you want gravity you can

622
00:30:46,149 --> 00:30:44,320
push it if you don't you can push it

623
00:30:48,470 --> 00:30:46,159
again okay so i think we've given people

624
00:30:50,950 --> 00:30:48,480
at home a really great idea on how to

625
00:30:52,870 --> 00:30:50,960
start their own lunar habitat yeah

626
00:30:54,630 --> 00:30:52,880
your imagination and what you find in

627
00:30:56,389 --> 00:30:54,640
your own house is the limit i can't wait

628
00:30:58,230 --> 00:30:56,399
to do this at home myself yeah so for

629
00:31:00,630 --> 00:30:58,240
those of you interested in participating

630
00:31:02,149 --> 00:31:00,640
in this activity and many others feel

631
00:31:05,990 --> 00:31:02,159
free to visit the website at the bottom

632
00:31:09,669 --> 00:31:08,070
so we've covered launch gateway and

633
00:31:11,750 --> 00:31:09,679
landing the next mission on the moon but

634
00:31:13,350 --> 00:31:11,760
there's another important step to what

635
00:31:15,269 --> 00:31:13,360
you've asked students to imagine that's

636
00:31:17,509 --> 00:31:15,279
right as important as all of those other

637
00:31:20,310 --> 00:31:17,519
aspects of the mission are we are going

638
00:31:22,230 --> 00:31:20,320

to explore so we asked students at the

639
00:31:24,230 --> 00:31:22,240
arizona science center to envision a

640
00:31:26,149 --> 00:31:24,240
lunar sample mission at the moon south

641
00:31:36,149 --> 00:31:26,159
pole this is what their imagination

642
00:31:40,389 --> 00:31:38,230
houston mission control here here at the

643
00:31:41,990 --> 00:31:40,399
optimal lunar south pole location to

644
00:31:43,990 --> 00:31:42,000
begin drilling for a quarter sample of

645
00:31:46,149 --> 00:31:44,000
water ice are you ready to start sample

646
00:31:48,389 --> 00:31:46,159
collection and analysis

647
00:31:50,389 --> 00:31:48,399
houston this is artemis 3 we're go for

648
00:31:52,470 --> 00:31:50,399
water ice sample collection the core

649
00:31:53,990 --> 00:31:52,480
drill is in position and rover analytic

650
00:31:56,710 --> 00:31:54,000
lab is ready

651
00:31:58,470 --> 00:31:56,720
proceed with collection and analysis

652
00:32:00,470 --> 00:31:58,480
drilling has started and is proceeding

653
00:32:02,630 --> 00:32:00,480
smoothly i'm really excited for the

654
00:32:04,149 --> 00:32:02,640
first woman to be on the moon because

655
00:32:06,630 --> 00:32:04,159
it's a really good

656
00:32:08,789 --> 00:32:06,640
achievement for america and the whole

657
00:32:11,029 --> 00:32:08,799
world i like to think of it as basically

658
00:32:12,710 --> 00:32:11,039
a gas station on the way to mars

659
00:32:15,509 --> 00:32:12,720
because from the earth to mars it's

660
00:32:18,549 --> 00:32:15,519
pretty far away so if we're able to go

661
00:32:20,549 --> 00:32:18,559
to the moon and split the like hydrogen

662
00:32:21,509 --> 00:32:20,559
atoms inside the ice that's hopefully

663
00:32:22,630 --> 00:32:21,519

there

664
00:32:24,230 --> 00:32:22,640
and

665
00:32:25,750 --> 00:32:24,240
create rocket fuel out of that i feel

666
00:32:27,590 --> 00:32:25,760
like that would be pretty cool i think

667
00:32:29,750 --> 00:32:27,600
it's important to have activities that

668
00:32:32,950 --> 00:32:29,760
really help students understand just how

669
00:32:35,110 --> 00:32:32,960
important this step is in possible solar

670
00:32:37,029 --> 00:32:35,120
system colonization

671
00:32:40,149 --> 00:32:37,039
stop drilling we are at the 20 inch mark

672
00:32:42,470 --> 00:32:40,159
lock drill to begin collecting sample

673
00:32:44,950 --> 00:32:42,480
collection complete anchor the drill for

674
00:32:48,389 --> 00:32:44,960
core extraction

675
00:32:50,630 --> 00:32:48,399
the drill is anchored begin extraction

676
00:32:51,790 --> 00:32:50,640
sample ready for analysis open rover

677
00:32:53,509 --> 00:32:51,800
sample container

678
00:32:55,509 --> 00:32:53,519
[Music]

679
00:32:58,070 --> 00:32:55,519
the container is open and ready begin

680
00:33:03,909 --> 00:33:00,310
i think it's important because it really

681
00:33:05,669 --> 00:33:03,919
is the first step in understanding space

682
00:33:07,430 --> 00:33:05,679
travel in general

683
00:33:08,149 --> 00:33:07,440
and along with that especially for mars

684
00:33:09,430 --> 00:33:08,159
just

685
00:33:13,110 --> 00:33:09,440
being able to see whether or not there's

686
00:33:15,590 --> 00:33:13,120
possible biological life in the uh ice

687
00:33:17,350 --> 00:33:15,600
of mars is just amazing they can really

688
00:33:19,590 --> 00:33:17,360

signal that perhaps there is a greater

689
00:33:21,029 --> 00:33:19,600
chance of life in our universe i feel

690
00:33:22,950 --> 00:33:21,039
like

691
00:33:24,070 --> 00:33:22,960
there's not any experiment that's more

692
00:33:25,990 --> 00:33:24,080
important than

693
00:33:28,630 --> 00:33:26,000
any other because any experiments any

694
00:33:31,110 --> 00:33:28,640
experiment they're all equally important

695
00:33:33,909 --> 00:33:31,120
analysis complete houston great news we

696
00:33:35,190 --> 00:33:33,919
have 72 percent water ice and 28

697
00:33:37,509 --> 00:33:35,200
regolith

698
00:33:39,110 --> 00:33:37,519
our aim is three that is great news

699
00:33:40,950 --> 00:33:39,120
those numbers suggest that this is an

700
00:33:43,430 --> 00:33:40,960
excellent location for a long duration

701
00:33:45,110 --> 00:33:43,440
lunar habitat this is an important step

702
00:33:46,549 --> 00:33:45,120
in helping to ensure this generation

703
00:33:47,909 --> 00:33:46,559
will be taking the first steps on the

704
00:33:50,310 --> 00:33:47,919
surface of mars

705
00:33:52,310 --> 00:33:50,320
great work houston out i feel like we

706
00:33:54,149 --> 00:33:52,320
can learn a lot about how the moon was

707
00:33:55,509 --> 00:33:54,159
formed and when we learn more about that

708
00:33:57,110 --> 00:33:55,519
we can learn more about how the earth

709
00:33:59,269 --> 00:33:57,120
was formed and

710
00:34:01,590 --> 00:33:59,279
learn more on from there i think just

711
00:34:03,750 --> 00:34:01,600
being able to say you're there first

712
00:34:07,990 --> 00:34:03,760
really making the mark for the 21st

713
00:34:11,669 --> 00:34:10,230

man i tell you these kids are great i

714
00:34:13,510 --> 00:34:11,679
love hearing how

715
00:34:15,349 --> 00:34:13,520
how excited they are for our lunar

716
00:34:17,109 --> 00:34:15,359
missions and to see them as they walk

717
00:34:18,389 --> 00:34:17,119
through these simulations and put this

718
00:34:20,550 --> 00:34:18,399
themselves in the role of flight

719
00:34:22,389 --> 00:34:20,560
controller an astronaut it's just

720
00:34:24,629 --> 00:34:22,399
inspirational and i can see how

721
00:34:26,710 --> 00:34:24,639
interactive these simulations are it

722
00:34:28,790 --> 00:34:26,720
starts really great uh conversations in

723
00:34:31,030 --> 00:34:28,800
the classroom and at home that's exactly

724
00:34:32,950 --> 00:34:31,040
what we aim to do with the activity

725
00:34:35,349 --> 00:34:32,960
guide encourage families to do these

726
00:34:37,829 --> 00:34:35,359
activities at home and talk about them

727
00:34:40,389 --> 00:34:37,839
that's really what science is all about

728
00:34:42,710 --> 00:34:40,399
asking the questions getting an answer

729
00:34:45,109 --> 00:34:42,720
and then asking the next question from

730
00:34:46,629 --> 00:34:45,119
what you learned and it was so much fun

731
00:34:49,109 --> 00:34:46,639
working with the kids at the different

732
00:34:51,669 --> 00:34:49,119
locations i want to send a big thank you

733
00:34:54,310 --> 00:34:51,679
to the cosmosphere the columbia memorial

734
00:34:56,550 --> 00:34:54,320
space center the st louis science center

735
00:34:58,710 --> 00:34:56,560
and the arizona science center for all

736
00:35:00,150 --> 00:34:58,720
their help in making this show possible

737
00:35:01,829 --> 00:35:00,160
it's great to work with such great

738
00:35:04,630 --> 00:35:01,839

organizations who have the same goals as

739
00:35:06,790 --> 00:35:04,640
nasa exactly there are great museums

740
00:35:09,109 --> 00:35:06,800
schools and other informal education

741
00:35:11,670 --> 00:35:09,119
organizations around the country doing

742
00:35:13,430 --> 00:35:11,680
amazing work to teach and encourage kids

743
00:35:15,349 --> 00:35:13,440
about stem

744
00:35:17,990 --> 00:35:15,359
we are going forward to the moon and to

745
00:35:20,150 --> 00:35:18,000
get us there and on to mars we need you

746
00:35:23,190 --> 00:35:20,160
the artemis generation to be the next

747
00:35:25,670 --> 00:35:23,200
scientists technologists engineers and

748
00:35:28,069 --> 00:35:25,680
mathematicians to take us further than

749
00:35:29,589 --> 00:35:28,079
we have ever gone before to learn more

750
00:35:32,310 --> 00:35:29,599
you can go to our website at

751
00:35:34,470 --> 00:35:32,320
www.nasa.gov

752
00:35:36,630 --> 00:35:34,480
forward slash stem and you can join our

753
00:35:39,670 --> 00:35:36,640
online conversation using the hashtag

754
00:35:41,349 --> 00:35:39,680
nasastem on facebook and twitter we will

755
00:35:43,589 --> 00:35:41,359
leave you now with a song from nasa's

756
00:35:48,930 --> 00:35:43,599
collection of moon tunes thanks for

757
00:36:03,510 --> 00:36:01,270
[Music]