



1  
00:00:27,359 --> 00:00:30,710

hey

2  
00:00:34,389 --> 00:00:33,110

are you lost again i'm completely lost

3  
00:00:37,110 --> 00:00:34,399

i'm looking for the wright brothers

4  
00:00:39,510 --> 00:00:37,120

cycle shop well you're in luck we are at

5  
00:00:41,270 --> 00:00:39,520

the greenfield village at the henry ford

6  
00:00:42,709 --> 00:00:41,280

now there are other things to see other

7  
00:00:43,910 --> 00:00:42,719

than the cycle shop do you want to hop

8  
00:00:48,150 --> 00:00:43,920

in the bottle team take a look

9  
00:00:51,830 --> 00:00:49,670

there are so many things you're going to

10  
00:00:59,830 --> 00:00:51,840

love in here and we get to ride the

11  
00:01:05,109 --> 00:01:02,869

so here in greenfield village henry ford

12  
00:01:06,630 --> 00:01:05,119

brought all these historic homes in

13  
00:01:11,350 --> 00:01:06,640

because they were going to be lost so he

14

00:01:15,590 --> 00:01:13,109

and here you can see

15

00:01:16,390 --> 00:01:15,600

the law office where lincoln practice

16

00:01:18,789 --> 00:01:16,400

law

17

00:01:21,109 --> 00:01:18,799

next to it is george washington carver's

18

00:01:26,070 --> 00:01:21,119

cabin

19

00:01:28,390 --> 00:01:26,080

ford had one built here but george

20

00:01:30,550 --> 00:01:28,400

washington carver came and stayed in it

21

00:01:32,390 --> 00:01:30,560

so technically it's his cabin i wonder

22

00:01:38,469 --> 00:01:32,400

if he had any peanut butter sandwiches

23

00:01:43,030 --> 00:01:40,870

also here you can see the

24

00:01:45,030 --> 00:01:43,040

first house that had electric lights

25

00:01:47,350 --> 00:01:45,040

lights built by thomas edison what a

26

00:01:49,990 --> 00:01:47,360

bright idea there's a lot more that we

27

00:02:01,429 --> 00:01:50,000

can see at the henry ford um including

28

00:02:09,270 --> 00:02:02,789

oh okay

29

00:02:13,830 --> 00:02:11,190

oh and there's the curator matt anderson

30

00:02:15,270 --> 00:02:13,840

hey matt how you doing good how are you

31

00:02:17,030 --> 00:02:15,280

could you take us into the right cycle

32

00:02:19,510 --> 00:02:17,040

shop i'll be glad you have some time

33

00:02:20,710 --> 00:02:19,520

i've got about 30 minutes why 30 minutes

34

00:02:47,830 --> 00:02:20,720

well because

35

00:02:47,840 --> 00:03:06,630

this is 7 30.

36

00:03:10,710 --> 00:03:08,869

hi i'm beth and i'm marty and normally

37

00:03:13,589 --> 00:03:10,720

we come to you live from the national

38

00:03:16,309 --> 00:03:13,599

air and space museum in washington dc

39

00:03:18,869 --> 00:03:16,319

but today we are actually in the right

40

00:03:22,630 --> 00:03:18,879

cycle shop at the greenfield village at

41

00:03:25,190 --> 00:03:22,640

the henry ford and we are so happy that

42

00:03:28,949 --> 00:03:25,200

matt anderson who's the curator here uh

43

00:03:30,949 --> 00:03:28,959

is able to join us now matt i know that

44

00:03:35,110 --> 00:03:30,959

the wright brothers for were from dayton

45

00:03:37,350 --> 00:03:35,120

ohio how did the cycle shop end up here

46

00:03:38,789 --> 00:03:37,360

right outside of detroit michigan well

47

00:03:41,190 --> 00:03:38,799

we're here in dearborn this is henry

48

00:03:42,470 --> 00:03:41,200

ford's hometown and henry ford started

49

00:03:44,630 --> 00:03:42,480

assembling greenfield village in the

50

00:03:46,470 --> 00:03:44,640

late 20s early 30s with buildings and

51  
00:03:48,309 --> 00:03:46,480  
houses related to prominent americans or

52  
00:03:50,309 --> 00:03:48,319  
people whom he admired he admired the

53  
00:03:51,910 --> 00:03:50,319  
wright brothers very much at the same

54  
00:03:53,670 --> 00:03:51,920  
time orville wright is concerned that

55  
00:03:55,750 --> 00:03:53,680  
the cycle shop in the house in dayton

56  
00:03:57,350 --> 00:03:55,760  
are starting to deteriorate he's looking

57  
00:03:58,949 --> 00:03:57,360  
for a new home for them and thinks this

58  
00:04:00,309 --> 00:03:58,959  
might be the place so brick by brick

59  
00:04:01,830 --> 00:04:00,319  
ford brought them up here they just

60  
00:04:04,630 --> 00:04:01,840  
packed it up and moved the whole thing

61  
00:04:06,309 --> 00:04:04,640  
that's right so matt why bikes why did

62  
00:04:08,149 --> 00:04:06,319  
the wright brothers build bicycles and

63  
00:04:09,750 --> 00:04:08,159

the rights were actually cashing in on a

64

00:04:11,670 --> 00:04:09,760

fad believe it or not

65

00:04:13,350 --> 00:04:11,680

everybody was riding bikes in the 1890s

66

00:04:15,589 --> 00:04:13,360

very very popular we take it for granted

67

00:04:16,949 --> 00:04:15,599

today but at the time it was incredibly

68

00:04:18,789 --> 00:04:16,959

exciting it was the closest thing to

69

00:04:21,030 --> 00:04:18,799

personal transportation since riding a

70

00:04:22,550 --> 00:04:21,040

horse so they got right in on that and

71

00:04:24,310 --> 00:04:22,560

did very well with it now we actually

72

00:04:26,310 --> 00:04:24,320

have one of the bikes right behind us

73

00:04:27,990 --> 00:04:26,320

that they built right yeah that is a van

74

00:04:29,270 --> 00:04:28,000

cleave that is a top of the line right

75

00:04:32,550 --> 00:04:29,280

cycle so that would have cost you about

76

00:04:34,469 --> 00:04:32,560

60 in the 1890s

77

00:04:36,150 --> 00:04:34,479

well we are going to be taking a look at

78

00:04:38,230 --> 00:04:36,160

some of the other uh

79

00:04:40,790 --> 00:04:38,240

buildings here in greenfield village but

80

00:04:43,189 --> 00:04:40,800

to get us started what we'd like to do

81

00:04:45,350 --> 00:04:43,199

is welcome our students from the henry

82

00:04:47,350 --> 00:04:45,360

ford academy thank you so much for

83

00:04:48,310 --> 00:04:47,360

joining us today

84

00:04:50,710 --> 00:04:48,320

and

85

00:04:53,110 --> 00:04:50,720

we want to remind everybody who is

86

00:04:55,110 --> 00:04:53,120

watching us online you can submit

87

00:04:56,629 --> 00:04:55,120

questions during the program and

88

00:04:58,629 --> 00:04:56,639

hopefully we'll be able to take some of

89

00:05:01,430 --> 00:04:58,639

those but if not we have an expert

90

00:05:02,870 --> 00:05:01,440

standing by and our expert will also be

91

00:05:04,950 --> 00:05:02,880

able to answer the questions that we

92

00:05:06,950 --> 00:05:04,960

don't get to today we'd also like to

93

00:05:08,629 --> 00:05:06,960

welcome elliot hines middle school

94

00:05:10,230 --> 00:05:08,639

they're watching the show today live

95

00:05:12,550 --> 00:05:10,240

back at the national air and space

96

00:05:14,230 --> 00:05:12,560

museum in washington dc they're going to

97

00:05:15,590 --> 00:05:14,240

be submitting some questions as well and

98

00:05:18,710 --> 00:05:15,600

hopefully we'll get to a few of those on

99

00:05:21,029 --> 00:05:18,720

the show today now we've taken a look at

100

00:05:24,710 --> 00:05:21,039

greenfield village but the henry ford is

101  
00:05:27,830 --> 00:05:24,720  
so much more check this out the henry

102  
00:05:30,550 --> 00:05:27,840  
ford located in dearborn michigan is 200

103  
00:05:31,749 --> 00:05:30,560  
acres of invention inspiration and

104  
00:05:33,749 --> 00:05:31,759  
innovation

105  
00:05:36,550 --> 00:05:33,759  
it is named for its founder the

106  
00:05:38,390 --> 00:05:36,560  
automobile industrialist henry ford and

107  
00:05:41,029 --> 00:05:38,400  
the collection highlights his efforts to

108  
00:05:43,510 --> 00:05:41,039  
preserve items of historical interest it

109  
00:05:46,390 --> 00:05:43,520  
began as a simple yet bold idea to

110  
00:05:48,310 --> 00:05:46,400  
document the genius of ordinary people

111  
00:05:50,150 --> 00:05:48,320  
by recognizing and preserving the

112  
00:05:53,029 --> 00:05:50,160  
objects they used in the course of their

113  
00:05:53,749 --> 00:05:53,039

everyday lives in this museum you can

114

00:05:55,430 --> 00:05:53,759

see

115

00:05:58,230 --> 00:05:55,440

rosa parks bus

116

00:06:06,150 --> 00:05:58,240

a series of presidential limousines as

117

00:06:09,670 --> 00:06:08,150

okay matt you've said that we are in the

118

00:06:10,790 --> 00:06:09,680

bike shop

119

00:06:14,390 --> 00:06:10,800

however

120

00:06:15,590 --> 00:06:14,400

this does not look at all like a bike

121

00:06:17,110 --> 00:06:15,600

shop

122

00:06:18,469 --> 00:06:17,120

yeah we're in the very back of the

123

00:06:19,990 --> 00:06:18,479

building here and this is a room that

124

00:06:21,670 --> 00:06:20,000

the brothers set up as sort of their

125

00:06:23,430 --> 00:06:21,680

in-house machine shop so they could do

126

00:06:25,510 --> 00:06:23,440

repairs on the bikes but then later do

127

00:06:28,870 --> 00:06:25,520

work on their gliders and airplanes

128

00:06:31,189 --> 00:06:28,880

now did the bike shop help fund this

129

00:06:32,790 --> 00:06:31,199

research that they were doing back here

130

00:06:34,629 --> 00:06:32,800

absolutely the wright brothers did not

131

00:06:35,670 --> 00:06:34,639

have any outside financial support for

132

00:06:37,110 --> 00:06:35,680

their airplanes they weren't getting

133

00:06:38,790 --> 00:06:37,120

money from the university or from the

134

00:06:40,230 --> 00:06:38,800

army everything they did had to be

135

00:06:42,309 --> 00:06:40,240

funded out of their own pockets so the

136

00:06:43,510 --> 00:06:42,319

bike shop profits were vital now the

137

00:06:45,830 --> 00:06:43,520

bike shop

138

00:06:47,350 --> 00:06:45,840

they built bikes but they also repaired

139

00:06:49,029 --> 00:06:47,360

and

140

00:06:51,189 --> 00:06:49,039

built their own bicycles is that correct

141

00:06:52,230 --> 00:06:51,199

would they build bikes back in this area

142

00:06:53,830 --> 00:06:52,240

they would they would use some of this

143

00:06:55,189 --> 00:06:53,840

equipment to do that and yeah they had

144

00:06:57,749 --> 00:06:55,199

their own brand of bikes that they sold

145

00:06:59,670 --> 00:06:57,759

in addition to other company bikes now

146

00:07:01,350 --> 00:06:59,680

how did they go about conducting their

147

00:07:04,070 --> 00:07:01,360

research i mean this was a whole new

148

00:07:05,589 --> 00:07:04,080

idea so where did they start yeah the

149

00:07:07,670 --> 00:07:05,599

rights were extremely methodical and

150

00:07:09,510 --> 00:07:07,680

they started by reading they wrote a

151

00:07:11,510 --> 00:07:09,520

letter the smithsonian asking for any

152

00:07:13,510 --> 00:07:11,520

information they had about aviation or

153

00:07:15,029 --> 00:07:13,520

aeronautics at that time and they also

154

00:07:16,629 --> 00:07:15,039

made a lot of use of their father's

155

00:07:18,230 --> 00:07:16,639

library milton wright was a great

156

00:07:20,629 --> 00:07:18,240

collector of books he had not only

157

00:07:22,150 --> 00:07:20,639

scientific tomes but also novels books

158

00:07:23,909 --> 00:07:22,160

of poetry things like that so they had a

159

00:07:25,990 --> 00:07:23,919

great start right in the home

160

00:07:27,990 --> 00:07:26,000

yeah so their their home library was

161

00:07:28,830 --> 00:07:28,000

really good starting point absolutely

162

00:07:32,230 --> 00:07:28,840

now

163

00:07:35,670 --> 00:07:32,240

why why were they able to succeed when

164

00:07:37,830 --> 00:07:35,680

so many others had failed at it

165

00:07:39,350 --> 00:07:37,840

making an airplane yeah the the rights

166

00:07:40,790 --> 00:07:39,360

had a lot of stick-to-itiveness they

167

00:07:42,710 --> 00:07:40,800

didn't give up and they had some

168

00:07:44,550 --> 00:07:42,720

difficult setbacks particularly after

169

00:07:46,550 --> 00:07:44,560

the 1901 glider didn't perform as well

170

00:07:47,749 --> 00:07:46,560

as they thought it should a lot of folks

171

00:07:49,510 --> 00:07:47,759

might have just walked away at that

172

00:07:51,510 --> 00:07:49,520

point but not the rights they went back

173

00:07:53,189 --> 00:07:51,520

they analyzed the problem figured out

174

00:07:54,629 --> 00:07:53,199

that the calculations they were using to

175

00:07:56,230 --> 00:07:54,639

determine their wing shape were

176

00:07:58,230 --> 00:07:56,240

incorrect so rather than giving up they

177

00:08:00,070 --> 00:07:58,240

went back and recalculated all those

178

00:08:02,070 --> 00:08:00,080

numbers themselves personally and

179

00:08:03,990 --> 00:08:02,080

obviously it worked out now how did they

180

00:08:05,909 --> 00:08:04,000

recalculate those numbers i understand

181

00:08:07,110 --> 00:08:05,919

there was a wind tunnel involved somehow

182

00:08:08,390 --> 00:08:07,120

they built their own wind tunnel and

183

00:08:09,990 --> 00:08:08,400

they actually appropriately enough

184

00:08:11,589 --> 00:08:10,000

rigged up a bicycle too so they could

185

00:08:13,029 --> 00:08:11,599

test different wing shapes on the bike

186

00:08:15,110 --> 00:08:13,039

and in the wind tunnel to determine how

187

00:08:18,150 --> 00:08:15,120

well they worked so they they knew that

188

00:08:20,469 --> 00:08:18,160

failure was okay so long as they

189

00:08:22,150 --> 00:08:20,479

they fixed the problem in the long run

190

00:08:23,510 --> 00:08:22,160

exactly failure wasn't a problem for

191

00:08:25,110 --> 00:08:23,520

them it was a learning experience and

192

00:08:27,029 --> 00:08:25,120

they could apply that lesson to the next

193

00:08:28,869 --> 00:08:27,039

step all right well would you like to

194

00:08:30,869 --> 00:08:28,879

take some questions from our audience

195

00:08:33,269 --> 00:08:30,879

i'd love to all right we have a video

196

00:08:35,829 --> 00:08:33,279

question

197

00:08:37,909 --> 00:08:35,839

hi my name is elizabeth wilson and my

198

00:08:39,990 --> 00:08:37,919

question is did they build the entire

199

00:08:41,670 --> 00:08:40,000

plane by themselves

200

00:08:43,509 --> 00:08:41,680

elizabeth that's a great question and

201  
00:08:45,190 --> 00:08:43,519  
for the most part they did though they

202  
00:08:47,030 --> 00:08:45,200  
did have some outside help with a very

203  
00:08:49,030 --> 00:08:47,040  
vital part they hired a fellow named

204  
00:08:50,150 --> 00:08:49,040  
charlie taylor to operate the cycle shop

205  
00:08:52,550 --> 00:08:50,160  
while they were at kitty hawk and

206  
00:08:54,790 --> 00:08:52,560  
getting more busy with their airplane

207  
00:08:56,870 --> 00:08:54,800  
but charlie also had a lot of skill with

208  
00:08:58,630 --> 00:08:56,880  
mechanical uh work and he was able to

209  
00:09:00,710 --> 00:08:58,640  
build the engine for the wright brothers

210  
00:09:01,829 --> 00:09:00,720  
and that's the one that powered the 1903

211  
00:09:03,829 --> 00:09:01,839  
flyer

212  
00:09:05,190 --> 00:09:03,839  
they couldn't just buy an engine they

213  
00:09:06,790 --> 00:09:05,200

thought that they could initially the

214

00:09:08,150 --> 00:09:06,800

automobile was really becoming popular

215

00:09:09,590 --> 00:09:08,160

at the same time they were doing these

216

00:09:11,030 --> 00:09:09,600

experiments and they kind of looked

217

00:09:13,110 --> 00:09:11,040

around but couldn't find anything that

218

00:09:14,790 --> 00:09:13,120

met their needs they actually had an

219

00:09:16,389 --> 00:09:14,800

engine made out of aluminum which was

220

00:09:17,910 --> 00:09:16,399

kind of cutting edge at that point and

221

00:09:20,389 --> 00:09:17,920

much lighter which was great for their

222

00:09:22,389 --> 00:09:20,399

plane okay so they needed a light engine

223

00:09:23,910 --> 00:09:22,399

to get off the ground absolutely charlie

224

00:09:25,590 --> 00:09:23,920

was able to help them he was able to do

225

00:09:27,190 --> 00:09:25,600

it all right let's take an online

226

00:09:29,670 --> 00:09:27,200

question

227

00:09:31,110 --> 00:09:29,680

does the wright brothers plane have any

228

00:09:33,190 --> 00:09:31,120

gears

229

00:09:34,710 --> 00:09:33,200

that's a great question yes if you take

230

00:09:36,630 --> 00:09:34,720

a look at it and you see it there's a

231

00:09:38,070 --> 00:09:36,640

lot of bicycle technology that went into

232

00:09:39,750 --> 00:09:38,080

that airplane you'll see the engine but

233

00:09:41,670 --> 00:09:39,760

it's connected by a couple of gears and

234

00:09:42,949 --> 00:09:41,680

then chains and sprockets just like the

235

00:09:45,110 --> 00:09:42,959

chain that connects your pedals to the

236

00:09:47,430 --> 00:09:45,120

rear tire of your bike so yes so they

237

00:09:49,269 --> 00:09:47,440

took the knowledge of just bike parts

238

00:09:51,269 --> 00:09:49,279

and then

239

00:09:53,670 --> 00:09:51,279

transferred that to the airplane as well

240

00:09:56,230 --> 00:09:53,680

exactly right yep okay and we have a

241

00:09:59,829 --> 00:09:56,240

question from miller's school uh where

242

00:10:01,990 --> 00:09:59,839

our henry ford academy students are

243

00:10:03,430 --> 00:10:02,000

hi there my name is omar alami how many

244

00:10:05,030 --> 00:10:03,440

different planes did the wright brothers

245

00:10:06,389 --> 00:10:05,040

make

246

00:10:07,990 --> 00:10:06,399

the wright brothers had a number of

247

00:10:10,069 --> 00:10:08,000

aircraft leading up to the successful

248

00:10:11,190 --> 00:10:10,079

1903 flyer they had built a couple of

249

00:10:13,350 --> 00:10:11,200

gliders

250

00:10:15,190 --> 00:10:13,360

say in 1901 they had problems with their

251  
00:10:16,870 --> 00:10:15,200  
glider 1902 they went back with these

252  
00:10:19,190 --> 00:10:16,880  
new calculations that one worked

253  
00:10:21,110 --> 00:10:19,200  
beautifully and then 1903 is the right

254  
00:10:23,269 --> 00:10:21,120  
flyer that sets that first flight that

255  
00:10:25,509 --> 00:10:23,279  
changes the world now they they built

256  
00:10:27,430 --> 00:10:25,519  
the right flyer did they build planes

257  
00:10:29,430 --> 00:10:27,440  
after the flyer or did they just build

258  
00:10:31,269 --> 00:10:29,440  
the airplane i was like okay that's just

259  
00:10:32,790 --> 00:10:31,279  
get up and let's go home and build bikes

260  
00:10:34,550 --> 00:10:32,800  
we think about the flyer that moment in

261  
00:10:36,069 --> 00:10:34,560  
december 17 1903 as being it the

262  
00:10:37,750 --> 00:10:36,079  
airplanes invented were done but wasn't

263  
00:10:38,949 --> 00:10:37,760

the case at all no they came back to

264

00:10:40,949 --> 00:10:38,959

dayton and they built a series of

265

00:10:42,550 --> 00:10:40,959

additional planes sort of refining and

266

00:10:45,190 --> 00:10:42,560

learning to master how to fly the

267

00:10:47,030 --> 00:10:45,200

aircraft and how to perfect it okay so

268

00:10:48,870 --> 00:10:47,040

uh the wright brothers were inventors

269

00:10:50,470 --> 00:10:48,880

and henry ford actually brought a bunch

270

00:10:53,269 --> 00:10:50,480

of these buildings up and we are going

271

00:10:55,190 --> 00:10:53,279

to go next door to miller's school

272

00:10:57,030 --> 00:10:55,200

uh where marty is with a bunch of

273

00:10:59,350 --> 00:10:57,040

students and we're going to see what

274

00:11:01,030 --> 00:10:59,360

they're working on

275

00:11:02,870 --> 00:11:01,040

thanks beth i'm here in miller's school

276

00:11:04,790 --> 00:11:02,880

and this is an exact replica of a

277

00:11:06,790 --> 00:11:04,800

one-room schoolhouse that henry ford

278

00:11:08,630 --> 00:11:06,800

actually attended now i've got my

279

00:11:10,630 --> 00:11:08,640

friends here from the henry ford academy

280

00:11:13,350 --> 00:11:10,640

and i've given them a job their job

281

00:11:15,829 --> 00:11:13,360

today is to actually make paper chain

282

00:11:17,829 --> 00:11:15,839

and they're doing it individually so

283

00:11:19,670 --> 00:11:17,839

they're measuring a strip out they're

284

00:11:21,670 --> 00:11:19,680

cutting it and then they're taping it

285

00:11:23,509 --> 00:11:21,680

and they're doing a you know a pretty

286

00:11:25,110 --> 00:11:23,519

good job now i'm gonna come over here

287

00:11:26,310 --> 00:11:25,120

and talk to my friend jake for a second

288

00:11:28,470 --> 00:11:26,320

now jake

289

00:11:30,710 --> 00:11:28,480

it doesn't seem as though you have very

290

00:11:32,389 --> 00:11:30,720

much paper chain made so far what's

291

00:11:33,990 --> 00:11:32,399

what's going on here uh i don't know i'm

292

00:11:35,910 --> 00:11:34,000

trying my hardest and uh i'm still

293

00:11:37,829 --> 00:11:35,920

trying to get it done okay but it's not

294

00:11:39,590 --> 00:11:37,839

it's not super fast is it no not very

295

00:11:41,269 --> 00:11:39,600

productive okay me here tell me a little

296

00:11:43,990 --> 00:11:41,279

bit uh you've got more chain what's

297

00:11:45,990 --> 00:11:44,000

going on over here um i cut them so in

298

00:11:47,829 --> 00:11:46,000

the different strips and i lose them but

299

00:11:49,590 --> 00:11:47,839

much faster okay so you're just going a

300

00:11:51,590 --> 00:11:49,600

little bit faster than jake over here

301  
00:11:53,350 --> 00:11:51,600  
okay well you guys are doing a pretty

302  
00:11:54,470 --> 00:11:53,360  
good job now here in a little bit we're

303  
00:11:56,230 --> 00:11:54,480  
going to come back we're going to try

304  
00:11:58,470 --> 00:11:56,240  
something different to make this paper

305  
00:12:00,150 --> 00:11:58,480  
chain in the meantime there are some

306  
00:12:02,310 --> 00:12:00,160  
other historic houses here and there's

307  
00:12:03,590 --> 00:12:02,320  
one right down the street that i want

308  
00:12:07,829 --> 00:12:03,600  
you to check out it's the wright

309  
00:12:12,230 --> 00:12:10,470  
matt i understand why the

310  
00:12:14,069 --> 00:12:12,240  
wright brothers cycling company was

311  
00:12:15,910 --> 00:12:14,079  
moved here to greenfield village but

312  
00:12:18,150 --> 00:12:15,920  
this is the wright brothers home why is

313  
00:12:19,670 --> 00:12:18,160

this here well the wright brothers being

314

00:12:21,509 --> 00:12:19,680

brothers were never apart from each

315

00:12:22,949 --> 00:12:21,519

other so the work never really stopped

316

00:12:24,629 --> 00:12:22,959

they talk about the airplane certainly

317

00:12:26,150 --> 00:12:24,639

in the shop but they'd also talk about

318

00:12:28,150 --> 00:12:26,160

it back home like here in this parlor so

319

00:12:31,030 --> 00:12:28,160

the house really is a part of the story

320

00:12:32,790 --> 00:12:31,040

now how far away was the house from the

321

00:12:34,150 --> 00:12:32,800

shop and they were about two and a half

322

00:12:36,949 --> 00:12:34,160

three blocks apart from each other in

323

00:12:39,269 --> 00:12:36,959

dayton now this is katherine wright's

324

00:12:41,350 --> 00:12:39,279

desk how is katherine wright important

325

00:12:42,310 --> 00:12:41,360

to this story catherine is absolutely

326

00:12:43,670 --> 00:12:42,320

important to the invention of the

327

00:12:45,509 --> 00:12:43,680

airplane because she supported her

328

00:12:47,110 --> 00:12:45,519

brothers really endlessly absolutely

329

00:12:48,230 --> 00:12:47,120

believed in what they were trying to do

330

00:12:49,590 --> 00:12:48,240

and you know neither of the brothers

331

00:12:51,670 --> 00:12:49,600

married they didn't have wives or

332

00:12:52,870 --> 00:12:51,680

children of their own so catherine was

333

00:12:54,389 --> 00:12:52,880

more than willing to handle some of

334

00:12:56,389 --> 00:12:54,399

their domestic chores she did their

335

00:12:57,829 --> 00:12:56,399

laundry cooking for them so they had a

336

00:12:59,430 --> 00:12:57,839

little more time to worry about and

337

00:13:01,509 --> 00:12:59,440

concentrate on the airplane yeah they

338

00:13:03,269 --> 00:13:01,519

grew up in this house how were their

339

00:13:04,949 --> 00:13:03,279

parents important i understand their

340

00:13:06,389 --> 00:13:04,959

father brought them a toy at some point

341

00:13:08,150 --> 00:13:06,399

yeah their father was a bishop with the

342

00:13:09,590 --> 00:13:08,160

anglican church he traveled a lot always

343

00:13:11,030 --> 00:13:09,600

brought back a toy for them and one of

344

00:13:13,190 --> 00:13:11,040

the toys he brought back was a little

345

00:13:15,110 --> 00:13:13,200

toy helicopter and they played around

346

00:13:16,550 --> 00:13:15,120

with us a lot as boys and that really

347

00:13:17,670 --> 00:13:16,560

first sparked the interest in aviation

348

00:13:18,790 --> 00:13:17,680

that would follow them through the rest

349

00:13:20,550 --> 00:13:18,800

of their lives and what about their

350

00:13:22,230 --> 00:13:20,560

mother susan their mother was actually

351  
00:13:23,750 --> 00:13:22,240  
very mechanically inclined so she played

352  
00:13:25,110 --> 00:13:23,760  
an important role in early influence on

353  
00:13:26,150 --> 00:13:25,120  
the boys she actually passed away when

354  
00:13:28,389 --> 00:13:26,160  
they were both

355  
00:13:30,629 --> 00:13:28,399  
teenagers so you know that was a great

356  
00:13:32,389 --> 00:13:30,639  
loss to them and they missed her but

357  
00:13:33,430 --> 00:13:32,399  
wilbur always thought of her death as

358  
00:13:34,870 --> 00:13:33,440  
something that kind of brought him out

359  
00:13:36,150 --> 00:13:34,880  
of his shell he went into a depression

360  
00:13:38,069 --> 00:13:36,160  
actually during his teenage years he'd

361  
00:13:39,430 --> 00:13:38,079  
been in a hockey accident caring for his

362  
00:13:41,509 --> 00:13:39,440  
mother actually kind of brought him out

363  
00:13:46,710 --> 00:13:41,519

that and got him on his way so the story

364

00:13:51,189 --> 00:13:48,230

matt i want to talk a little bit about

365

00:13:52,790 --> 00:13:51,199

the wright family we know about wilbur

366

00:13:54,150 --> 00:13:52,800

and orville they invented the airplane

367

00:13:56,230 --> 00:13:54,160

and we just heard about their sister

368

00:13:58,069 --> 00:13:56,240

catherine but there were more right

369

00:13:59,829 --> 00:13:58,079

children is that correct yeah there were

370

00:14:01,590 --> 00:13:59,839

a couple of older brothers rooshlyn and

371

00:14:03,350 --> 00:14:01,600

lauren and they both moved out and had

372

00:14:05,590 --> 00:14:03,360

families of their own but often came

373

00:14:06,790 --> 00:14:05,600

back to visit but uh yes orville wilbur

374

00:14:09,990 --> 00:14:06,800

and catherine all lived at home with the

375

00:14:11,269 --> 00:14:10,000

bishop now only one of them went to

376

00:14:13,030 --> 00:14:11,279

college

377

00:14:14,710 --> 00:14:13,040

yes and catherine was actually the only

378

00:14:17,110 --> 00:14:14,720

one to go to college she went to oberlin

379

00:14:18,949 --> 00:14:17,120

graduated in 1898 and came back and

380

00:14:21,110 --> 00:14:18,959

actually taught high school in dayton

381

00:14:23,189 --> 00:14:21,120

and it was unusual at the time for

382

00:14:25,350 --> 00:14:23,199

actually the woman of the family to have

383

00:14:27,110 --> 00:14:25,360

the degree it was and you have to give

384

00:14:28,790 --> 00:14:27,120

credit to catherine not only is she

385

00:14:30,470 --> 00:14:28,800

managing the domestic side of the wright

386

00:14:32,310 --> 00:14:30,480

family with the help of a housekeeper

387

00:14:34,069 --> 00:14:32,320

she's also out earning a living on her

388

00:14:35,910 --> 00:14:34,079

own as a teacher too so very busy and

389

00:14:38,310 --> 00:14:35,920

very important to their work and she

390

00:14:40,310 --> 00:14:38,320

became sort of a celebrity in her own

391

00:14:42,470 --> 00:14:40,320

right didn't she yeah wilbur and orville

392

00:14:44,150 --> 00:14:42,480

were both kind of reserved shy fellows

393

00:14:46,629 --> 00:14:44,160

catherine did not have that problem at

394

00:14:48,069 --> 00:14:46,639

all very boisterous and outgoing and she

395

00:14:49,269 --> 00:14:48,079

often made the social connections for

396

00:14:51,269 --> 00:14:49,279

them especially when they went over to

397

00:14:52,870 --> 00:14:51,279

france in 1908 and she became a

398

00:14:56,550 --> 00:14:52,880

celebrity in your own right over there

399

00:14:59,910 --> 00:14:56,560

now we are in a tiny little lab shall we

400

00:15:03,509 --> 00:14:59,920

say but here in greenfield village

401  
00:15:05,030 --> 00:15:03,519  
there's another much larger lab do you

402  
00:15:07,590 --> 00:15:05,040  
want to tell us where we're going to go

403  
00:15:09,189 --> 00:15:07,600  
next yeah henry ford admired no one

404  
00:15:10,470 --> 00:15:09,199  
quite as much as thomas edison so of

405  
00:15:11,670 --> 00:15:10,480  
course one of the first buildings he had

406  
00:15:13,750 --> 00:15:11,680  
built in greenfield village was a

407  
00:15:15,910 --> 00:15:13,760  
replica of edison's original menlo park

408  
00:15:21,670 --> 00:15:15,920  
complex all right should we go take a

409  
00:15:27,350 --> 00:15:23,910  
we're in a reconstruction of thomas

410  
00:15:29,590 --> 00:15:27,360  
edison's menlo park lab now this looks a

411  
00:15:31,110 --> 00:15:29,600  
lot different than the wright brothers

412  
00:15:32,949 --> 00:15:31,120  
bike shop can you tell us a little bit

413  
00:15:34,389 --> 00:15:32,959

about that yeah this is a building

414

00:15:36,629 --> 00:15:34,399

actually designed by edison to be

415

00:15:37,990 --> 00:15:36,639

conducive to his inventive process so it

416

00:15:39,910 --> 00:15:38,000

really is what they used to call an

417

00:15:41,189 --> 00:15:39,920

invention factory the world's first

418

00:15:43,269 --> 00:15:41,199

research and development lab you might

419

00:15:45,269 --> 00:15:43,279

call it now it wasn't just edison

420

00:15:47,350 --> 00:15:45,279

working here he had a few people working

421

00:15:48,870 --> 00:15:47,360

with him he did edison had a whole team

422

00:15:50,230 --> 00:15:48,880

of folks working under his direction

423

00:15:52,310 --> 00:15:50,240

originally was about a dozen people

424

00:15:53,990 --> 00:15:52,320

maybe 15 and then it grew to between 60

425

00:15:55,670 --> 00:15:54,000

and 80 at the height of menlo park's

426

00:15:57,269 --> 00:15:55,680

productivity now there were two big

427

00:15:58,949 --> 00:15:57,279

inventions that came out of here can you

428

00:16:01,350 --> 00:15:58,959

tell us about those the two big ones

429

00:16:04,310 --> 00:16:01,360

were the phonograph in 1877 and then the

430

00:16:06,790 --> 00:16:04,320

incandescent light bulb in 1879. and

431

00:16:08,790 --> 00:16:06,800

edison didn't just invent these things

432

00:16:11,030 --> 00:16:08,800

to invent them he actually did this for

433

00:16:12,550 --> 00:16:11,040

profit yeah edison was an inventor by

434

00:16:14,310 --> 00:16:12,560

trade he depended on the money that he

435

00:16:15,910 --> 00:16:14,320

would make from his inventions here to

436

00:16:17,910 --> 00:16:15,920

to live and a lot of that money that he

437

00:16:19,990 --> 00:16:17,920

made he put right back into developing

438

00:16:21,590 --> 00:16:20,000

menlo park growing the complex but yes

439

00:16:23,269 --> 00:16:21,600

he was absolutely dependent on patent

440

00:16:25,110 --> 00:16:23,279

productions and successful marketing of

441

00:16:26,310 --> 00:16:25,120

his inventions now one of the things

442

00:16:28,310 --> 00:16:26,320

that you notice when you walk in here

443

00:16:29,910 --> 00:16:28,320

are all of the glass jars all over the

444

00:16:32,310 --> 00:16:29,920

walls and they're just filled with a

445

00:16:34,069 --> 00:16:32,320

variety of different things why is that

446

00:16:36,069 --> 00:16:34,079

yeah edison had an ambition to have at

447

00:16:37,590 --> 00:16:36,079

least some sample of every substance

448

00:16:39,350 --> 00:16:37,600

known to humankind it was a tall

449

00:16:40,949 --> 00:16:39,360

ambition he didn't quite get there but

450

00:16:42,470 --> 00:16:40,959

you can see by the number of jars and

451

00:16:43,910 --> 00:16:42,480

bottles in this building he was serious

452

00:16:45,350 --> 00:16:43,920

about it and you never knew what

453

00:16:46,629 --> 00:16:45,360

substance you might need to work on your

454

00:16:48,150 --> 00:16:46,639

various experiments he certainly used a

455

00:16:49,430 --> 00:16:48,160

lot of these different things in trying

456

00:16:51,269 --> 00:16:49,440

to find a long lasting light bulb

457

00:16:52,550 --> 00:16:51,279

filament

458

00:16:55,030 --> 00:16:52,560

now

459

00:16:56,550 --> 00:16:55,040

this chair seems to be bolted to the

460

00:16:58,790 --> 00:16:56,560

ground and we're not allowed to sit in

461

00:17:00,230 --> 00:16:58,800

it why is that yeah the last person who

462

00:17:03,110 --> 00:17:00,240

sit in that chair was actually thomas

463

00:17:04,870 --> 00:17:03,120

edison himself in 1929 on the 50th

464

00:17:06,309 --> 00:17:04,880

anniversary of the successful invention

465

00:17:08,069 --> 00:17:06,319

of the light bulb they kind of recreated

466

00:17:09,429 --> 00:17:08,079

the moment here in this building it was

467

00:17:10,949 --> 00:17:09,439

a big deal they had a live radio

468

00:17:13,270 --> 00:17:10,959

broadcast people were listening around

469

00:17:15,429 --> 00:17:13,280

the world and as edison finished the

470

00:17:17,029 --> 00:17:15,439

demonstration right behind me here he

471

00:17:19,350 --> 00:17:17,039

actually sort of literally bashed in the

472

00:17:21,029 --> 00:17:19,360

glow of that light bulb and ford was so

473

00:17:22,470 --> 00:17:21,039

moved ford of course being a great fan

474

00:17:24,150 --> 00:17:22,480

of thomas edison's he said you know

475

00:17:25,829 --> 00:17:24,160

that's it nail that chair to the floor

476  
00:17:27,270 --> 00:17:25,839  
and it's been there ever since awesome

477  
00:17:30,390 --> 00:17:27,280  
well thank you so much for showing us

478  
00:17:35,190 --> 00:17:32,710  
let's compare lab size here now edison

479  
00:17:38,310 --> 00:17:35,200  
had a huge lab and this is pretty small

480  
00:17:40,150 --> 00:17:38,320  
could they build the whole airplane here

481  
00:17:41,510 --> 00:17:40,160  
no actually the whole plane wouldn't fit

482  
00:17:43,190 --> 00:17:41,520  
in this building so they'd have to build

483  
00:17:45,190 --> 00:17:43,200  
it in sections disassembled then

484  
00:17:47,669 --> 00:17:45,200  
reassemble it at kitty hawk now when you

485  
00:17:49,190 --> 00:17:47,679  
invent something to protect it what do

486  
00:17:51,029 --> 00:17:49,200  
you have to do

487  
00:17:52,710 --> 00:17:51,039  
yeah you want to get patent protection

488  
00:17:54,470 --> 00:17:52,720

and that prevents anyone else from

489

00:17:56,710 --> 00:17:54,480

profiting on your hard work so it was an

490

00:17:59,669 --> 00:17:56,720

important thing to do now did thomas

491

00:18:01,669 --> 00:17:59,679

edison had thousands of edison had more

492

00:18:03,510 --> 00:18:01,679

than a thousand patents in his lifetime

493

00:18:05,830 --> 00:18:03,520

yes now did he fill out all the

494

00:18:06,950 --> 00:18:05,840

paperwork and send it all out himself he

495

00:18:09,110 --> 00:18:06,960

didn't he probably would have spent his

496

00:18:10,390 --> 00:18:09,120

whole life on paperwork but he was so

497

00:18:11,990 --> 00:18:10,400

important in building inventions they

498

00:18:14,150 --> 00:18:12,000

were so crucial to his work that he had

499

00:18:16,070 --> 00:18:14,160

a staff to help do that for him so he

500

00:18:18,070 --> 00:18:16,080

had someone filling out government

501  
00:18:19,990 --> 00:18:18,080  
paperwork for something exactly okay

502  
00:18:22,710 --> 00:18:20,000  
what about the wright brothers did they

503  
00:18:24,310 --> 00:18:22,720  
did they have a patent much more modest

504  
00:18:25,669 --> 00:18:24,320  
the rights really had one essential

505  
00:18:27,830 --> 00:18:25,679  
patent and that's the one that covered

506  
00:18:30,150 --> 00:18:27,840  
their control system for the airplane

507  
00:18:31,590 --> 00:18:30,160  
and did they do that patent themselves

508  
00:18:33,510 --> 00:18:31,600  
patents were a little bit beyond the

509  
00:18:35,190 --> 00:18:33,520  
rights area of expertise so they very

510  
00:18:36,470 --> 00:18:35,200  
wisely brought in an attorney to help

511  
00:18:39,190 --> 00:18:36,480  
them write that patent and it did

512  
00:18:40,390 --> 00:18:39,200  
eventually get improved okay so do you

513  
00:18:42,710 --> 00:18:40,400

want to go back and see what marty's

514

00:18:44,789 --> 00:18:42,720

doing let's okay marty what are you

515

00:18:46,390 --> 00:18:44,799

doing over at miller school

516

00:18:48,070 --> 00:18:46,400

all right thanks beth we've changed up

517

00:18:49,990 --> 00:18:48,080

how we're actually making the paper

518

00:18:51,590 --> 00:18:50,000

chain this time and we're using a method

519

00:18:53,669 --> 00:18:51,600

that henry ford

520

00:18:56,070 --> 00:18:53,679

worked on a lot and that's the assembly

521

00:18:58,230 --> 00:18:56,080

line he really refined the assembly line

522

00:19:00,630 --> 00:18:58,240

and it increased his production eight to

523

00:19:02,950 --> 00:19:00,640

one what normally took 12 and a half

524

00:19:04,950 --> 00:19:02,960

hours to create with a car

525

00:19:06,470 --> 00:19:04,960

dropped down to an hour and a half as a

526

00:19:09,190 --> 00:19:06,480

matter of fact they were rolling model

527

00:19:10,950 --> 00:19:09,200

t's off the line every three minutes so

528

00:19:14,070 --> 00:19:10,960

let's check in with these guys and see

529

00:19:15,830 --> 00:19:14,080

if we've increased production at all so

530

00:19:17,990 --> 00:19:15,840

all right tell me now

531

00:19:20,549 --> 00:19:18,000

you're very specialized right now what

532

00:19:22,390 --> 00:19:20,559

are you doing i'm cutting the strips for

533

00:19:24,549 --> 00:19:22,400

the paper chain is that all that you're

534

00:19:26,310 --> 00:19:24,559

doing yes okay so you've really

535

00:19:28,870 --> 00:19:26,320

specialized you're only doing one job do

536

00:19:30,470 --> 00:19:28,880

you think you're faster at this yes okay

537

00:19:32,710 --> 00:19:30,480

how about you over here you you've got

538

00:19:34,470 --> 00:19:32,720

the same job right yeah okay so tell me

539

00:19:35,669 --> 00:19:34,480

about the job is it is it a little

540

00:19:37,029 --> 00:19:35,679

boring

541

00:19:38,470 --> 00:19:37,039

not really no

542

00:19:41,190 --> 00:19:38,480

do you think you're getting faster as

543

00:19:42,870 --> 00:19:41,200

you practice it okay well guys hold up

544

00:19:44,230 --> 00:19:42,880

the paper chain that we've got back here

545

00:19:45,909 --> 00:19:44,240

how are we doing on the paper chain

546

00:19:50,630 --> 00:19:45,919

let's see

547

00:19:52,070 --> 00:19:50,640

paper chain than we had last time um so

548

00:19:54,390 --> 00:19:52,080

you can really see that the assembly

549

00:19:56,549 --> 00:19:54,400

line really does increase production and

550

00:19:58,310 --> 00:19:56,559

teachers this is an activity that you

551  
00:20:00,870 --> 00:19:58,320  
can do in your classrooms we're going to

552  
00:20:02,630 --> 00:20:00,880  
post the lesson plan online and you can

553  
00:20:04,549 --> 00:20:02,640  
bring this into your class and show

554  
00:20:07,110 --> 00:20:04,559  
students how assembly lines increase

555  
00:20:08,549 --> 00:20:07,120  
production another great activity that

556  
00:20:10,310 --> 00:20:08,559  
you can do with your students is a

557  
00:20:12,549 --> 00:20:10,320  
website created by the national air and

558  
00:20:18,149 --> 00:20:12,559  
space museum called engineering the

559  
00:20:22,390 --> 00:20:20,149  
this site you can step into the shoes of

560  
00:20:24,789 --> 00:20:22,400  
the wright brothers you can design the

561  
00:20:26,789 --> 00:20:24,799  
wing shape and size then travel to kitty

562  
00:20:28,310 --> 00:20:26,799  
hawk to test your glider

563  
00:20:29,750 --> 00:20:28,320

some of our friends from ball state

564

00:20:31,830 --> 00:20:29,760

university who are helping us with the

565

00:21:08,710 --> 00:20:31,840

show today took a crack at flying the

566

00:21:12,710 --> 00:21:10,390

nice job guys

567

00:21:15,110 --> 00:21:12,720

coming in january you will be able to

568

00:21:17,430 --> 00:21:15,120

design an engine propellers and

569

00:21:19,510 --> 00:21:17,440

ultimately pilot the right flyer

570

00:21:21,110 --> 00:21:19,520

simulator but if you're going to get

571

00:21:24,310 --> 00:21:21,120

your plane into the air like the wright

572

00:21:26,789 --> 00:21:24,320

brothers did on december 17 1903 you'll

573

00:21:29,110 --> 00:21:26,799

need more than a steady hand you'll need

574

00:21:31,190 --> 00:21:29,120

to solve difficult aeronautical problems

575

00:21:33,510 --> 00:21:31,200

and prove your engineering solutions

576  
00:21:35,430 --> 00:21:33,520  
through rigorous testing before taking

577  
00:21:36,870 --> 00:21:35,440  
to the air at kitty hawk

578  
00:21:39,350 --> 00:21:36,880  
do you have what it takes to be an

579  
00:21:42,830 --> 00:21:39,360  
aeronautical engineer find out with

580  
00:21:46,549 --> 00:21:44,950  
way matt would you like to take some

581  
00:21:50,390 --> 00:21:46,559  
more questions i'd love to all right

582  
00:21:55,110 --> 00:21:52,710  
my name is lucia

583  
00:21:57,590 --> 00:21:55,120  
and my question is

584  
00:21:59,750 --> 00:21:57,600  
the wright brothers had a bright bike

585  
00:22:01,190 --> 00:21:59,760  
shop but did they have any other

586  
00:22:02,870 --> 00:22:01,200  
businesses

587  
00:22:04,950 --> 00:22:02,880  
well that's an excellent question lucia

588  
00:22:06,950 --> 00:22:04,960

and yes the wright brothers did have a

589

00:22:09,190 --> 00:22:06,960

different business before they got into

590

00:22:11,190 --> 00:22:09,200

bicycles they were job printers they

591

00:22:13,990 --> 00:22:11,200

would print things like stationary or

592

00:22:15,669 --> 00:22:14,000

letterhead posters cards

593

00:22:17,510 --> 00:22:15,679

and they built one of the printing

594

00:22:19,909 --> 00:22:17,520

presses themselves so they got a lot of

595

00:22:21,510 --> 00:22:19,919

skill in woodworking metal working and

596

00:22:23,270 --> 00:22:21,520

surprisingly a lot of those skills were

597

00:22:24,549 --> 00:22:23,280

helpful in building the right flyer so

598

00:22:26,070 --> 00:22:24,559

they could take some of that experience

599

00:22:27,750 --> 00:22:26,080

from the print shop right into their

600

00:22:29,110 --> 00:22:27,760

airplane work i would have never thought

601  
00:22:30,789 --> 00:22:29,120  
that a print shop would have helped you

602  
00:22:32,710 --> 00:22:30,799  
build an airplane but what about the

603  
00:22:34,789 --> 00:22:32,720  
bicycle did the bicycle help them build

604  
00:22:36,789 --> 00:22:34,799  
airplanes yeah the bicycle was really

605  
00:22:38,470 --> 00:22:36,799  
the the key thing i think for the wright

606  
00:22:39,830 --> 00:22:38,480  
brothers that they brought to the whole

607  
00:22:42,390 --> 00:22:39,840  
project

608  
00:22:44,310 --> 00:22:42,400  
an airplane is an inherently unstable

609  
00:22:45,510 --> 00:22:44,320  
vehicle but so is a bicycle you get on

610  
00:22:46,870 --> 00:22:45,520  
and you've got to make all kinds of

611  
00:22:48,710 --> 00:22:46,880  
little movements to keep those two

612  
00:22:50,549 --> 00:22:48,720  
wheels upright we don't even think about

613  
00:22:51,990 --> 00:22:50,559

it it becomes second nature a lot of

614

00:22:53,510 --> 00:22:52,000

people were trying to build an airplane

615

00:22:54,789 --> 00:22:53,520

so that it would be stable you'd get up

616

00:22:55,750 --> 00:22:54,799

there and the pilot wouldn't have to do

617

00:22:57,270 --> 00:22:55,760

anything

618

00:22:58,789 --> 00:22:57,280

the rights realized that people could

619

00:23:01,029 --> 00:22:58,799

handle making all those adjustments

620

00:23:02,149 --> 00:23:01,039

because we can ride bikes so they didn't

621

00:23:03,830 --> 00:23:02,159

worry about trying to make the plane

622

00:23:06,149 --> 00:23:03,840

inherently stable just put it up as it

623

00:23:08,470 --> 00:23:06,159

is so it may be unstable but still

624

00:23:11,110 --> 00:23:08,480

controllable exactly right all right

625

00:23:13,350 --> 00:23:11,120

let's take an online question

626

00:23:15,430 --> 00:23:13,360

did the wright brothers ever test a

627

00:23:19,029 --> 00:23:15,440

scale model of their plane in the wind

628

00:23:20,789 --> 00:23:19,039

tunnel or did they only test airfoils

629

00:23:22,390 --> 00:23:20,799

they really tested just the airfoils in

630

00:23:23,909 --> 00:23:22,400

the wind tunnel though they did try

631

00:23:25,830 --> 00:23:23,919

scale models of their designs in the

632

00:23:27,990 --> 00:23:25,840

form of kites before they would actually

633

00:23:29,750 --> 00:23:28,000

try to fly a person up in their gliders

634

00:23:30,950 --> 00:23:29,760

how many different airfoils did they

635

00:23:32,789 --> 00:23:30,960

test in the wind tunnel do they have any

636

00:23:34,870 --> 00:23:32,799

idea many many many that they went

637

00:23:36,630 --> 00:23:34,880

through and yes they were kept careful

638

00:23:37,990 --> 00:23:36,640

notes of the exact shape and size and

639

00:23:40,070 --> 00:23:38,000

how much resistance and lift was

640

00:23:41,750 --> 00:23:40,080

generated based on that model and really

641

00:23:42,870 --> 00:23:41,760

very intricate and very advanced

642

00:23:44,390 --> 00:23:42,880

thinking for the wright brothers and

643

00:23:46,230 --> 00:23:44,400

that's and they they used the wind

644

00:23:48,789 --> 00:23:46,240

tunnel after they had the unfortunate

645

00:23:50,070 --> 00:23:48,799

incidents with the 1901 exactly right

646

00:23:51,350 --> 00:23:50,080

they couldn't rely on the tables that

647

00:23:52,870 --> 00:23:51,360

they've been reading from books anymore

648

00:23:54,390 --> 00:23:52,880

so they had to go back and study each

649

00:23:56,710 --> 00:23:54,400

one of these shapes to see how much lift

650

00:23:58,630 --> 00:23:56,720

it generated okay well let's go back to

651  
00:24:01,110 --> 00:23:58,640  
miller school and uh have a question

652  
00:24:02,950 --> 00:24:01,120  
from the henry ford academy

653  
00:24:05,029 --> 00:24:02,960  
hi my name is matthew havis and i wanted

654  
00:24:06,950 --> 00:24:05,039  
to know between the two brothers will

655  
00:24:09,750 --> 00:24:06,960  
and orville who have more input in the

656  
00:24:11,510 --> 00:24:09,760  
project to build the aircraft

657  
00:24:13,029 --> 00:24:11,520  
that's a great question too which

658  
00:24:14,230 --> 00:24:13,039  
brother was more behind the project and

659  
00:24:15,750 --> 00:24:14,240  
i think you have to give credit to

660  
00:24:17,510 --> 00:24:15,760  
wilbur he's the one that first had the

661  
00:24:19,510 --> 00:24:17,520  
idea of going into the airplane business

662  
00:24:21,029 --> 00:24:19,520  
or at least studying the problem and he

663  
00:24:22,789 --> 00:24:21,039

got his brother orville involved pretty

664

00:24:23,909 --> 00:24:22,799

quickly but wilbur probably gets the

665

00:24:25,830 --> 00:24:23,919

lion's share of the credit for getting

666

00:24:27,269 --> 00:24:25,840

them started once they were going it was

667

00:24:28,789 --> 00:24:27,279

very much a joint venture though so they

668

00:24:30,549 --> 00:24:28,799

were really sort of a team once they

669

00:24:32,230 --> 00:24:30,559

started rolling with this project

670

00:24:34,870 --> 00:24:32,240

absolutely but wilbur probably had the

671

00:24:36,950 --> 00:24:34,880

spark first okay matt we have time for

672

00:24:38,950 --> 00:24:36,960

another video question so let's take a

673

00:24:41,029 --> 00:24:38,960

video question

674

00:24:42,710 --> 00:24:41,039

how long did the first airplane flight

675

00:24:43,990 --> 00:24:42,720

last

676

00:24:45,510 --> 00:24:44,000

all right elizabeth good question the

677

00:24:47,110 --> 00:24:45,520

first airplane flight was a short one

678

00:24:49,430 --> 00:24:47,120

only about 12 seconds and they covered

679

00:24:51,190 --> 00:24:49,440

about 120 feet but that's all it took to

680

00:24:53,029 --> 00:24:51,200

change the world did they get better as

681

00:24:54,630 --> 00:24:53,039

they tested it they did actually that

682

00:24:57,110 --> 00:24:54,640

day each flight was a little bit better

683

00:24:58,470 --> 00:24:57,120

and by the last flight they traveled 852

684

00:25:01,110 --> 00:24:58,480

feet and they were in the air for almost

685

00:25:02,630 --> 00:25:01,120

a minute oh wow okay uh we have another

686

00:25:05,029 --> 00:25:02,640

question from miller's school let's go

687

00:25:06,950 --> 00:25:05,039

back and see what they have for us

688

00:25:08,870 --> 00:25:06,960

hello my name is jerome williams and i

689

00:25:10,630 --> 00:25:08,880

wonder did the wright brothers have a

690

00:25:12,070 --> 00:25:10,640

mentor or somebody looked up to for

691

00:25:13,590 --> 00:25:12,080

inspiration

692

00:25:15,830 --> 00:25:13,600

that's a terrific question and they did

693

00:25:17,510 --> 00:25:15,840

have a mentor uh well their father was a

694

00:25:18,950 --> 00:25:17,520

mentor for one thing he kind of inspired

695

00:25:21,190 --> 00:25:18,960

them by way of his example and the way

696

00:25:23,269 --> 00:25:21,200

that he lived his life but in terms of

697

00:25:24,549 --> 00:25:23,279

aviation octave chanu was an important

698

00:25:26,149 --> 00:25:24,559

influence for the wright brothers they

699

00:25:27,990 --> 00:25:26,159

developed a very friendly correspondence

700

00:25:30,390 --> 00:25:28,000

with him he came out and visited them in

701  
00:25:31,669 --> 00:25:30,400  
dayton and at kitty hawk and helped help

702  
00:25:32,950 --> 00:25:31,679  
him along the way it gave him a lot of

703  
00:25:34,789 --> 00:25:32,960  
encouragement now was he doing

704  
00:25:36,230 --> 00:25:34,799  
aeronautic testing at the same time he

705  
00:25:37,669 --> 00:25:36,240  
was doing some of his own testing he was

706  
00:25:38,950 --> 00:25:37,679  
quite a bit older than the right so he

707  
00:25:40,470 --> 00:25:38,960  
wouldn't actually fly in the planes

708  
00:25:42,310 --> 00:25:40,480  
himself he just felt that was too risky

709  
00:25:44,070 --> 00:25:42,320  
for someone of his age but he was

710  
00:25:45,269 --> 00:25:44,080  
involved in a lot of the design work and

711  
00:25:46,789 --> 00:25:45,279  
he gave some pointers to the wright

712  
00:25:48,470 --> 00:25:46,799  
brothers and also got wilbur an

713  
00:25:50,070 --> 00:25:48,480

invitation to speak before some

714

00:25:52,549 --> 00:25:50,080

engineers in the city of chicago which

715

00:25:53,990 --> 00:25:52,559

kind of boosted their reputation so

716

00:25:55,590 --> 00:25:54,000

there were a lot of people helping them

717

00:25:56,870 --> 00:25:55,600

along the way they were so we think

718

00:25:58,470 --> 00:25:56,880

about them two people kind of working

719

00:25:59,909 --> 00:25:58,480

alone in in their shop but it's more

720

00:26:01,510 --> 00:25:59,919

than that i mean they had their family

721

00:26:02,870 --> 00:26:01,520

their sister catherine they had people

722

00:26:04,710 --> 00:26:02,880

like schnoot and they had all sorts of

723

00:26:05,830 --> 00:26:04,720

folks who were at least involved in some

724

00:26:07,750 --> 00:26:05,840

form and bringing the airplane to

725

00:26:09,190 --> 00:26:07,760

fruition thank you for telling us is a

726  
00:26:10,470 --> 00:26:09,200  
little bit of the story we're out of

727  
00:26:12,549 --> 00:26:10,480  
time today

728  
00:26:13,909 --> 00:26:12,559  
we want to make sure that you join us

729  
00:26:18,390 --> 00:26:13,919  
next month when we talk about the

730  
00:26:19,990 --> 00:26:18,400  
lindbergh's uh so check this out

731  
00:26:25,590 --> 00:26:20,000  
hi i'm marty kelsey one of the hosts of

732  
00:26:31,350 --> 00:26:28,070  
this is a periscope on the spirit of

733  
00:26:32,950 --> 00:26:31,360  
saint louis there's no front windshield

734  
00:26:34,549 --> 00:26:32,960  
the only way that charles lindbergh

735  
00:26:36,390 --> 00:26:34,559  
could look forward on his flight from

736  
00:26:38,710 --> 00:26:36,400  
new york to paris was to look through

737  
00:26:40,789 --> 00:26:38,720  
this periscope

738  
00:26:42,789 --> 00:26:40,799

that's phenomenal if you think this is

739

00:26:50,870 --> 00:26:42,799

interesting be sure to tune in to stem

740

00:26:54,789 --> 00:26:52,789

matt thank you so much for being with us

741

00:26:56,549 --> 00:26:54,799

here today and i want to thank the henry

742

00:26:58,470 --> 00:26:56,559

ford for hosting and we also want to

743

00:27:00,310 --> 00:26:58,480

thank our sponsor alcoa we couldn't do

744

00:27:04,870 --> 00:27:00,320

this if it weren't for them thank you