WEBVTT

1
00:00:00.700 --> 00:00:00.800
truth

2
00:00:03.300 --> 00:00:06.600
I something that caught me on his resume is

3
00:00:06.600 --> 00:00:09.400
his secondary education with a physics

4
00:00:09.400 --> 00:00:12.100
endorsement. And so I have a bit of

5
00:00:12.100 --> 00:00:16.100
a story that I think I'd like to tell you

6
00:00:15.100 --> 00:00:18.500
that, you know,

7
00:00:18.500 --> 00:00:21.200
some of the things that High School teachers have to

8
00:00:21.200 --> 00:00:23.300
deal with from my high school experience.

9
00:00:24.400 --> 00:00:26.300
in physics class and so

10
00:00:27.900 --> 00:00:30.700
long about 1982 in way Upstate

11
00:00:30.700 --> 00:00:33.100
New York the smartest kid in

12
00:00:33.100 --> 00:00:35.400
the class before class starts.

13
00:00:36.300 --> 00:00:40.200
is getting a little harassment from one of the other students and

14
00:00:42.300 --> 00:00:45.300
he says what do you want me to do jump out the

15
00:00:45.300 --> 00:00:45.500
window?

16
00:00:46.300 --> 00:00:50.600
And it's a pretty high Second Story in this

17
00:00:49.600 --> 00:00:52.400
school and the

18
00:00:52.400 --> 00:00:55.600
kids said yeah jump out the window. And so

19
00:00:57.700 --> 00:01:00.300
You know, it's everybody's just talking and it's before class

20
00:01:00.300 --> 00:01:01.400
actually started.

21
00:01:02.600 --> 00:01:05.400
And he walks over to the window and he doesn't like

22
00:01:05.400 --> 00:01:08.500
gently ease over and hang

23
00:01:08.500 --> 00:01:11.200
down in the window and go out. He stands on

24
00:01:11.200 --> 00:01:14.100
the windowsill on a window. That's about two feet

25
00:01:14.100 --> 00:01:15.300
wide and eight foot tall.

26
00:01:16.300 --> 00:01:18.000
and jumps out

27
00:01:18.800 --> 00:01:21.000

didn't hesitate in the least and this kid

28
00:01:21.200 --> 00:01:24.100
was probably the smartest kid in the school for sure and you know,

29
00:01:24.100 --> 00:01:24.500
maybe

30
00:01:25.400 --> 00:01:26.600
some social issues, but

31
00:01:28.700 --> 00:01:31.400
So anyway, we all in

32
00:01:31.400 --> 00:01:32.300
a panic.

33
00:01:33.200 --> 00:01:36.600
Rush to the window and he's not there all we

34
00:01:36.600 --> 00:01:39.600
see are these two six inch

35
00:01:39.600 --> 00:01:42.700
foot imprints in the snow out there

36
00:01:42.700 --> 00:01:45.500
and he had worked his way back around

37
00:01:45.500 --> 00:01:48.200
to the door. And before we came away from the window

38
00:01:48.200 --> 00:01:51.300
wondering what had gone on. This student is back up in

39
00:01:51.300 --> 00:01:54.800
the classroom simultaneously the our

40
00:01:54.800 --> 00:01:57.100
physics instructor walks into

41
00:01:57.100 --> 00:01:57.900
the classroom.

42
00:01:58.700 --> 00:02:01.200
And is wondering like what is going

43
00:02:01.200 --> 00:02:04.500
on here? Why is everybody in such turmoil and we're

44
00:02:04.500 --> 00:02:04.600
like

45
00:02:06.300 --> 00:02:09.400
Chris just jumped out the window and now he's back up

46
00:02:09.400 --> 00:02:12.500
here and the physics teacher.

47
00:02:12.500 --> 00:02:15.800
He's pretty eccentric. He says

48
00:02:15.800 --> 00:02:19.100
this is a spectacular opportunity

49
00:02:18.100 --> 00:02:21.500
for an experiment. Let me grab my

50
00:02:21.500 --> 00:02:24.900
meter stick and see if he's compressed any and

51
00:02:24.900 --> 00:02:27.300
no joke. He that is exactly

52
00:02:27.300 --> 00:02:31.100
what he said, then he's like, okay, Chris go sit down and about

53
00:02:30.100 --> 00:02:33.400
10 minutes later. He recognized that

54
00:02:33.400 --> 00:02:36.700

this is perhaps a warning flag and

55
00:02:36.700 --> 00:02:39.200
sent him down to the office. But anyway, I

56
00:02:39.200 --> 00:02:40.800
got the greatest respect. Thank you, Dan.

57
00:02:51.800 --> 00:02:54.800
Yes, so yeah being at being a teacher basically you

58
00:02:54.800 --> 00:02:57.500
have to be quick on your feet at times there. It

59
00:02:57.500 --> 00:03:00.200
sounds like he was that. So anyway, I'm really happy to

60
00:03:00.200 --> 00:03:03.700
be here. Thank you for the introduction. And I'm glad to see everybody is

61
00:03:03.700 --> 00:03:06.800
still here being the last presentation. I don't

62
00:03:06.800 --> 00:03:09.400
know if you want to hear what I have to say or is

63
00:03:09.400 --> 00:03:13.100
there more free food after this so maybe that

64
00:03:13.100 --> 00:03:16.400
anyway, so this is actually kind of appropriate to

65
00:03:16.400 --> 00:03:19.400
kind of my presentation on flight test Academy

66
00:03:19.400 --> 00:03:23.000
to kind of book and what are our guest

67
00:03:22.100 --> 00:03:25.400
speaker last night at the dinner was talking

68
00:03:25.400 --> 00:03:28.100
about that. So I'm honored to be

69
00:03:28.100 --> 00:03:31.100
here, you know like you I want to

70
00:03:31.100 --> 00:03:35.900
be here to you know, improve the

71
00:03:35.900 --> 00:03:39.200
flight test Community safety and

72
00:03:38.200 --> 00:03:42.600
and just the Aerospace safety

73
00:03:41.600 --> 00:03:42.900
as well.

74
00:03:44.200 --> 00:03:47.100
It's also nice to see younger Engineers out there.

75
00:03:47.100 --> 00:03:50.400
I Define a younger engineer. Is

76
00:03:50.400 --> 00:03:52.300
anybody half my age?

77
00:03:53.400 --> 00:03:57.100
So it is it is good to see them, but I

78
00:03:56.100 --> 00:03:59.500
do have a question when

79
00:04:01.200 --> 00:04:04.800
This conference kind of rolls around and comes

80
00:04:04.800 --> 00:04:04.900
back.

81
00:04:06.100 --> 00:04:09.400

To the Florida area, you know maybe in 10

82
00:04:09.400 --> 00:04:12.500
years or something who will

83
00:04:12.500 --> 00:04:15.200
those younger engineers in the audience be?

84
00:04:17.900 --> 00:04:19.600
How will we attract them?

85
00:04:21.200 --> 00:04:22.200
to the Aerospace

86
00:04:23.400 --> 00:04:26.400
community in the Aerospace industry

87
00:04:27.500 --> 00:04:28.700
Where are they now?

88
00:04:30.400 --> 00:04:33.000
Well, I'll tell you where they are now. They're in high school.

89
00:04:34.400 --> 00:04:37.400
They're in junior high and they're in high school. So Claude could

90
00:04:37.400 --> 00:04:40.200
you roll that film please? So that's

91
00:04:40.200 --> 00:04:44.500
where they are now and we have to attract those into those

92
00:04:44.500 --> 00:04:45.100
students.

93
00:04:46.700 --> 00:04:49.400
Um, so that producing the flight test Academy

94
00:04:49.400 --> 00:04:52.400
the spot this may help Seattle chapter of the Society of

95
00:04:52.400 --> 00:04:55.400
flight test Engineers learning Aerospace through

96
00:04:55.400 --> 00:04:58.700
flight testing high school students and teachers whether online

97
00:04:58.700 --> 00:05:01.700
or in-person will be able to learn and explore flight

98
00:05:01.700 --> 00:05:04.400
testing through video-based instruction, utilizing a

99
00:05:04.400 --> 00:05:07.500
desktop flight simulator. No previous flying or

100
00:05:07.500 --> 00:05:10.200
airplane experience is required or assumed for

101
00:05:10.200 --> 00:05:14.100
either students or instructors. This self-contained Academy

102
00:05:13.100 --> 00:05:17.500
includes units that teach basic and

103
00:05:17.500 --> 00:05:20.600
advanced takeoff testing where students conduct performance take off

104
00:05:20.600 --> 00:05:23.300
tests and determine their Runway distance that was used

105
00:05:23.300 --> 00:05:26.600
this unit. Also teaches airplane Anatomy airplane

106
00:05:26.600 --> 00:05:29.900
forces and the base of the X-Plane software

107
00:05:29.900 --> 00:05:32.200
when students Advance they will

108
00:05:32.200 --> 00:05:35.600

determine Runway distance using the kinematic equations

109
00:05:35.600 --> 00:05:38.700
climb, testing and data

110
00:05:38.700 --> 00:05:41.300
plotting including drag climb test planning and

111
00:05:41.300 --> 00:05:42.900
data recovery and Analysis.

112
00:05:43.800 --> 00:05:46.500
Also Cruise testing and data

113
00:05:46.500 --> 00:05:49.600
plotting which also includes Cruise test planning and data recovery

114
00:05:49.600 --> 00:05:50.400
and Analysis.

115
00:05:54.400 --> 00:05:56.000
What factors affect takeoff distance?

116
00:05:56.300 --> 00:05:59.900
Will flaps decreaser increase takeoff distance or how

117
00:05:59.900 --> 00:06:03.600
will weight affect the takeoff distance to cap

118
00:06:03.600 --> 00:06:06.700
the project using the knowledge obtained from the previous lessons

119
00:06:06.700 --> 00:06:09.400
and flight test Academy students can participate

120
00:06:09.400 --> 00:06:12.300
in the Apple challenge where they try to fly as many apples to

121
00:06:12.300 --> 00:06:15.400
Seattle from Washington's Farm country and Eastern Washington

122
00:06:15.400 --> 00:06:18.200
using the most efficient climb and

123
00:06:18.200 --> 00:06:21.400
cruise speeds obtained from student flight. Testing is the goal

124
00:06:21.400 --> 00:06:24.100
all lesson plans and videos

125
00:06:24.100 --> 00:06:28.000
are downloadable from the website Seattle sfte.org.

126
00:06:29.100 --> 00:06:32.700
Flight test Academy is provided at no cost that requires just

127
00:06:32.700 --> 00:06:35.500
computer and internet connection and a free

128
00:06:35.500 --> 00:06:37.900
demo of the X-Plane flight simulator software.

129
00:06:46.100 --> 00:06:47.100
Okay. Alright. Thank you.

130
00:06:49.100 --> 00:06:52.800
So that that video was created by one of my students there.

131
00:06:52.800 --> 00:06:55.700
So I thought he did a great job with that introducing the

132
00:06:55.700 --> 00:06:58.400
flight test Academy sponsored by the Seattle chapter

133
00:06:58.400 --> 00:07:01.200
of the Society of it was so good. We want to

134
00:07:01.200 --> 00:07:01.700
see it twice.

135
00:07:03.300 --> 00:07:06.600

Okay. So what is flight test Academy? So basically

136
00:07:06.600 --> 00:07:09.700
it is a source for it's a web-based

137
00:07:09.700 --> 00:07:12.800
source for authentic Aerospace stem projects.

138
00:07:12.800 --> 00:07:16.500
It contains the series of

139
00:07:16.500 --> 00:07:19.600
instructional videos and other resources for

140
00:07:19.600 --> 00:07:22.300
for instructors. It started

141
00:07:22.300 --> 00:07:25.900
out as as just regular

142
00:07:25.900 --> 00:07:28.800
instruction in-person instruction, but then covid

143
00:07:28.800 --> 00:07:31.400
had the opportunity then to to move this

144
00:07:31.400 --> 00:07:34.600
to an online platform and teach it

145
00:07:34.600 --> 00:07:34.900
online.

146
00:07:36.100 --> 00:07:39.500
So it can be used for in-person remote learning

147
00:07:39.500 --> 00:07:42.200
or home school classes. We start

148
00:07:42.200 --> 00:07:45.300
off with a basic takeoff performance testing

149
00:07:45.300 --> 00:07:48.900
and then progress to more advanced topics. It's scalable.

150
00:07:48.900 --> 00:07:52.400
You know, the first unit is except,

151
00:07:51.400 --> 00:07:54.800
you know, it's scalable to junior high students and

152
00:07:54.800 --> 00:07:57.300
then certainly high school students can do

153
00:07:57.300 --> 00:08:00.400
the rest of it. And what's nice about it. There's no flying

154
00:08:00.400 --> 00:08:03.600
experience expected or assume for

155
00:08:03.600 --> 00:08:06.500
either the the instructor or the for the

156
00:08:06.500 --> 00:08:06.800
students.

157
00:08:08.300 --> 00:08:12.000
Here's kind of the the outline of the syllabus it contains

158
00:08:11.200 --> 00:08:14.200
five units, you know,

159
00:08:14.200 --> 00:08:17.200
basic takeoff, testing Advanced takeoff testing. Then we

160
00:08:17.200 --> 00:08:20.300
go to the advanced climbing Cruise testing

161
00:08:20.300 --> 00:08:21.700
and then the Capstone project.

162
00:08:23.200 --> 00:08:26.500

Kind of the summary of the units unit 1 there's you know

163
00:08:26.500 --> 00:08:30.100
brings everybody up to speed on. You know, what an airplane is airplane

164
00:08:29.100 --> 00:08:32.000
Anatomy forces of flight how to fly

165
00:08:32.700 --> 00:08:35.000
How to read instruments, you know all of that.

166
00:08:36.200 --> 00:08:39.700
We use the simulator X-Plane. So we go through

167
00:08:39.700 --> 00:08:42.200
lessons on how to how to set that

168
00:08:42.200 --> 00:08:45.500
up including the data to

169
00:08:45.500 --> 00:08:48.500
record and all of that and then how to

170
00:08:48.500 --> 00:08:51.300
fly the test then we they do some basic

171
00:08:51.300 --> 00:08:54.700
takeoff testings. Then we go to Advanced takeoff testing

172
00:08:54.700 --> 00:08:57.800
where now we introduce the lift equation

173
00:08:57.800 --> 00:09:00.600
in the kinematic equations. So

174
00:09:00.600 --> 00:09:03.200
now the students are doing repeating some of

175
00:09:03.200 --> 00:09:07.100
their takeoff testing, but now they are calculating their

176
00:09:06.100 --> 00:09:09.800
own takeoff distance using the kinematic equations.

177
00:09:11.300 --> 00:09:14.500
And then climb climbing Cruise testing explores the

178
00:09:14.500 --> 00:09:17.800
drag equation and then you actually, you

179
00:09:17.800 --> 00:09:20.600
know, try to fly and determine your best climb

180
00:09:20.600 --> 00:09:23.500
speeds and your best cruise speeds. The Capstone

181
00:09:23.500 --> 00:09:27.000
project is basically put all that together and and fly

182
00:09:26.300 --> 00:09:28.300
a simulated cargo mission.

183
00:09:29.700 --> 00:09:32.600
So again a grade level the grade

184
00:09:32.600 --> 00:09:35.200
level is junior high can do the unit one there

185
00:09:35.200 --> 00:09:38.800
and then High School's students can

186
00:09:38.800 --> 00:09:41.600
can do the entire thing and then

187
00:09:41.600 --> 00:09:44.100
actually unit. We've been doing this

188
00:09:44.100 --> 00:09:47.300
for about 10 years and for unit one and two and that

189
00:09:47.300 --> 00:09:49.200

takes about 10 weeks and that's a kind of a

190
00:09:50.100 --> 00:09:53.800
You know, there's a lot to do in the 10 weeks and then another 10

191
00:09:53.800 --> 00:09:55.700
weeks for the remaining three units.

192
00:09:57.500 --> 00:10:00.100
So how does this fit into the you know,

193
00:10:00.100 --> 00:10:03.800
the learning standards? So the Next Generation science

194
00:10:03.800 --> 00:10:06.000
standards when I looked at

195
00:10:06.300 --> 00:10:10.200
those it checks a lot of the boxes. So this basically

196
00:10:09.200 --> 00:10:12.200
we're talking we're talking

197
00:10:12.200 --> 00:10:16.000
about an experiment an aerospace experiment. So all

198
00:10:15.300 --> 00:10:18.400
the math and the planning and all that kind

199
00:10:18.400 --> 00:10:21.100
of goes in there. So checks a lot of the boxes for that.

200
00:10:22.700 --> 00:10:25.500
I've included student level objectives are

201
00:10:25.500 --> 00:10:28.200
provided to instructors and teachers for assessments.

202
00:10:29.300 --> 00:10:33.000
But basically this course is you know

203
00:10:33.500 --> 00:10:36.500
demonstrates the basic tentative of students making an

204
00:10:36.500 --> 00:10:39.600
observation and then using mathematical tools

205
00:10:39.600 --> 00:10:42.600
to develop the theories to try to explain that behavior.

206
00:10:44.700 --> 00:10:47.800
And like the previous speaker in

207
00:10:47.800 --> 00:10:51.800
front of me. There is some math associated with this we do

208
00:10:51.800 --> 00:10:54.700
the you know, the relationships between velocity

209
00:10:54.700 --> 00:10:57.600
time and distance the students again,

210
00:10:57.600 --> 00:11:01.200
calculate distance either using average average

211
00:11:00.200 --> 00:11:03.500
velocity or you can introduce

212
00:11:03.500 --> 00:11:06.300
acceleration and they can calculate distance from that

213
00:11:06.300 --> 00:11:09.300
introduce the both the lift

214
00:11:09.300 --> 00:11:13.200
and the drag equations and then, you know, try to we

215
00:11:12.200 --> 00:11:15.300
don't derive them or what everybody go through

216
00:11:15.300 --> 00:11:18.000

each of the parameters and you know,

217
00:11:18.400 --> 00:11:21.300
try to ask questions. Okay. So what's the most important parameter? What's

218
00:11:21.300 --> 00:11:23.300
the parameter that has the biggest effect?

219
00:11:24.200 --> 00:11:26.400
for example on lift or drag

220
00:11:27.100 --> 00:11:30.700
and then we you know, you have to go through units conversions because

221
00:11:30.700 --> 00:11:33.500
we're going from knots to miles an hour and whatever

222
00:11:33.500 --> 00:11:34.900
so we cover that.

223
00:11:37.400 --> 00:11:40.600
In addition, there's a lot of soft skills, like all

224
00:11:40.600 --> 00:11:43.500
of us in flight test, you know,

225
00:11:43.500 --> 00:11:46.500
there's a lot of things that are not taught in the

226
00:11:46.500 --> 00:11:49.400
in the curriculum of being a

227
00:11:49.400 --> 00:11:52.500
test pilot or an engineer and that

228
00:11:52.500 --> 00:11:55.400
has to do with you know, in the area of test planning. Okay,

229
00:11:55.400 --> 00:11:58.700
understanding the goal the test developing the

230
00:11:58.700 --> 00:12:01.900
test plan following the test plan

231
00:12:01.900 --> 00:12:05.100
configuration control. What flap

232
00:12:04.100 --> 00:12:06.800
setting did you use for that takeoff?

233
00:12:07.600 --> 00:12:10.300
What data did you record? Oh, you didn't record the

234
00:12:10.300 --> 00:12:13.100
data. You didn't record the right kind of data,

235
00:12:13.100 --> 00:12:16.600
you know, when they do the the data recovery,

236
00:12:16.600 --> 00:12:19.100
then you know, they have to you know, determine how to

237
00:12:19.100 --> 00:12:22.500
plot the data and manipulate it and then

238
00:12:22.500 --> 00:12:25.400
of course you have to, you know, come to some sort of conclusion and

239
00:12:25.400 --> 00:12:30.200
then write a report all of those things come come

240
00:12:29.200 --> 00:12:32.500
in through this project. In

241
00:12:32.500 --> 00:12:35.500
fact after the end

242
00:12:35.500 --> 00:12:39.400
of the project we get together and actually this Seattle

243

00:12:38.400 --> 00:12:41.300
Society comes in acts as judges.

244
00:12:42.300 --> 00:12:45.300
Society sfts comes in acts as

245
00:12:45.300 --> 00:12:49.800
judges and we hear the same stories of you

246
00:12:48.800 --> 00:12:51.700
know, miscalibrated data

247
00:12:51.700 --> 00:12:54.300
the pilot had to fly it again, whatever the

248
00:12:54.300 --> 00:12:57.300
same things that we in real life experience. So

249
00:12:57.300 --> 00:13:00.800
it's really an authentic representation

250
00:13:00.800 --> 00:13:01.400
of what we do.

251
00:13:02.900 --> 00:13:05.500
Here are some people other than

252
00:13:05.500 --> 00:13:08.200
than me that endorsed this there's a teacher

253
00:13:08.200 --> 00:13:11.500
a flight test pilot. You may know and the

254
00:13:11.500 --> 00:13:14.800
audience wait a was we were privileged

255
00:13:14.800 --> 00:13:17.200
to have him participate one time when

256
00:13:17.200 --> 00:13:20.400
he was in in Seattle there. So he endorses

257
00:13:20.400 --> 00:13:23.300
it and then and then students themselves appreciate it as

258
00:13:23.300 --> 00:13:23.400
well.

259
00:13:25.100 --> 00:13:28.300
So just run through the the units quickly. So

260
00:13:28.300 --> 00:13:31.500
again, we're taking the unit one takes students and

261
00:13:31.500 --> 00:13:34.300
teachers that don't know anything about airplane and walks

262
00:13:34.300 --> 00:13:37.200
them through the anatomy of the airplane. The axis reading flight

263
00:13:37.200 --> 00:13:41.200
instruments the forces and then exploit introduction

264
00:13:40.200 --> 00:13:43.300
unit 2

265
00:13:43.300 --> 00:13:46.700
is where we introduce the lift equation

266
00:13:46.700 --> 00:13:50.400
and then also the kinematic equations and they

267
00:13:49.400 --> 00:13:52.200
produce data like this and

268
00:13:52.200 --> 00:13:54.800
then determine the distance from from that.

269
00:13:56.400 --> 00:13:59.700
they also changed factors that affect the lift equation redo

270

00:13:59.700 --> 00:14:01.100
the test and then see what

271
00:14:01.900 --> 00:14:03.500
Any effect of that?

272
00:14:04.700 --> 00:14:08.400
Here's a summary of

273
00:14:08.400 --> 00:14:09.500
some student data.

274
00:14:10.300 --> 00:14:13.600
This is where they were testing the Triple 7

275
00:14:13.600 --> 00:14:15.400
and they were varying gross weight.

276
00:14:16.100 --> 00:14:19.400
Let's see. This is the oops. Nope.

277
00:14:21.900 --> 00:14:24.100
Where's the pointer? Oh, here it is. So anyway,

278
00:14:24.100 --> 00:14:27.000
so basically weight is gross weight is on the

279
00:14:27.900 --> 00:14:30.200
x-axis and we got takeoff distance and like you

280
00:14:30.200 --> 00:14:33.400
would expect the heavier the airplane the more

281
00:14:33.400 --> 00:14:37.200
takeoff distance, you would require and things

282
00:14:36.200 --> 00:14:39.500
like, you know, the data is,

283
00:14:39.500 --> 00:14:42.400
you know, in night tight nice tight groups, you

284
00:14:42.400 --> 00:14:45.800
know is important and and that is

285
00:14:45.800 --> 00:14:46.800
expected as well.

286
00:14:48.900 --> 00:14:51.300
Unit 3 is we go to climb testing and

287
00:14:51.300 --> 00:14:54.800
surprisingly the simulator

288
00:14:54.800 --> 00:14:58.000
is sensitive enough. The simulation is

289
00:14:57.600 --> 00:15:00.900
sensitive enough that you can get reasonable

290
00:15:00.900 --> 00:15:03.900
data. This is a Cessna 172 and

291
00:15:03.900 --> 00:15:05.000
you can see the two peaks.

292
00:15:05.900 --> 00:15:08.300
Of the curve that you know that that

293
00:15:08.300 --> 00:15:11.400
identify the both best rate

294
00:15:11.400 --> 00:15:14.300
of climb and the best angle of climb so so that comes

295
00:15:14.300 --> 00:15:14.500
out.

296
00:15:16.500 --> 00:15:20.500
As to the increased testing where

297

00:15:19.500 --> 00:15:22.100
we can you know, determine what the

298
00:15:22.100 --> 00:15:25.500
El over D ratio is and then we can look

299
00:15:25.500 --> 00:15:28.100
at see what the speed is that associated with

300
00:15:28.100 --> 00:15:29.200
maximum range.

301
00:15:32.900 --> 00:15:35.200
So unit 5 is the kind of

302
00:15:35.200 --> 00:15:38.500
the Capstone project. So you use all that data that

303
00:15:38.500 --> 00:15:41.400
you've done previously The Climb data and the cruise

304
00:15:41.400 --> 00:15:44.700
data and then you simulate a

305
00:15:44.700 --> 00:15:49.200
cargo Mission from two

306
00:15:47.200 --> 00:15:50.200
places in in the Seattle

307
00:15:50.200 --> 00:15:53.200
area Wenatchee and Seattle. So students have

308
00:15:53.200 --> 00:15:56.800
to determine the distance. They have to determine I

309
00:15:56.800 --> 00:15:59.300
give them the altitude to make it kind of consistent.

310
00:16:00.100 --> 00:16:04.200
Given the altitude and then they use their their own

311
00:16:04.200 --> 00:16:06.100
test data for climb.

312
00:16:06.600 --> 00:16:08.100
Okay, so what your climb speed?

313
00:16:09.300 --> 00:16:10.400
How are you going to climb?

314
00:16:11.200 --> 00:16:14.500
Can you figure out how long it's going to take? Yes?

315
00:16:15.300 --> 00:16:18.700
You know how long it's going to take and you know, you feel flow. You

316
00:16:18.700 --> 00:16:21.300
can determine how much fuel is going to take to climb.

317
00:16:21.800 --> 00:16:24.200
Same thing with cruise. How long is it

318
00:16:24.200 --> 00:16:27.700
how fast are you gonna go how much fuel

319
00:16:27.700 --> 00:16:28.100
you're going to use?

320
00:16:28.900 --> 00:16:31.800
And the object of the game is to

321
00:16:31.800 --> 00:16:34.600
carry as

322
00:16:34.600 --> 00:16:36.200
many apples or payload.

323
00:16:37.300 --> 00:16:41.400
As you can from Seattle to Wenatchee without going

324

00:16:40.400 --> 00:16:42.800
into your reserve field.

325
00:16:43.500 --> 00:16:46.300
So there are certain parameters. We give them the gross weight the emperor

326
00:16:46.300 --> 00:16:48.400
we give them the empty weight given the pilot weight.

327
00:16:48.900 --> 00:16:51.500
We give them you know, 30 minutes of reserve of

328
00:16:51.500 --> 00:16:54.400
fuel whatever that is and then say Okay load up

329
00:16:54.400 --> 00:16:55.400
apples and fuel.

330
00:16:56.300 --> 00:16:57.000
To get you there.

331
00:16:58.400 --> 00:17:00.100
We also expect them to take a look at the

332
00:17:03.200 --> 00:17:06.500
Introduce them to strip chart data and ask them

333
00:17:06.500 --> 00:17:09.500
to you know produce strip chart data for their flight.

334
00:17:11.800 --> 00:17:14.500
Now there's also extensions if that's not enough

335
00:17:14.500 --> 00:17:18.300
in in the 20 weeks. Actually,

336
00:17:17.300 --> 00:17:21.400
there are some extensions it

337
00:17:20.400 --> 00:17:24.100

would included within explain is a plane

338
00:17:23.100 --> 00:17:27.400
maker software. We're actually you can make modifications to

339
00:17:27.400 --> 00:17:30.800
the airplane. What I mean is you can make the wing longer you

340
00:17:30.800 --> 00:17:33.400
can make it fatter. You can put winglets on

341
00:17:33.400 --> 00:17:36.400
it. You can do a lot of things. So I

342
00:17:36.400 --> 00:17:40.300
mean, this is a perfect introduction to what Aerospace you

343
00:17:39.300 --> 00:17:42.700
know, testing what flight testing is is, you know,

344
00:17:42.700 --> 00:17:45.200
you do the Baseline testing you put winglets on

345
00:17:45.200 --> 00:17:48.800
and now go see what the the results see

346
00:17:48.800 --> 00:17:50.300
if it improved or it didn't

347
00:17:50.900 --> 00:17:53.600
So anyway, so there's a lot of things that you can do with with

348
00:17:53.600 --> 00:17:54.900
the software.

349
00:17:56.600 --> 00:18:00.000
So what does it what does it require? Well, not

350
00:17:59.300 --> 00:18:02.700
much. So basically obviously we

351
00:18:02.700 --> 00:18:05.200
need a lap a laptop or a desktop

352
00:18:05.200 --> 00:18:06.300
computer with a mouse.

353
00:18:07.100 --> 00:18:10.600
So some people said, well, how about how about

354
00:18:10.600 --> 00:18:13.200
a joystick? Well, you know, I work in

355
00:18:13.200 --> 00:18:17.300
a public school environment and you know, there's not a lot of money for joysticks

356
00:18:16.300 --> 00:18:19.200
and stuff. So basically I had to,

357
00:18:19.200 --> 00:18:22.500
you know create this to make sure and I flew it.

358
00:18:22.500 --> 00:18:24.500
I flew it all for the mouse.

359
00:18:25.300 --> 00:18:28.500
So Canada is sometimes difficult.

360
00:18:28.500 --> 00:18:31.900
I do encourage the autopilot use on

361
00:18:31.900 --> 00:18:34.300
for the cruise for the cruise stuff. So we

362
00:18:34.300 --> 00:18:37.100
we cheat on that but the other stuff is by the mouse.

363
00:18:37.100 --> 00:18:40.400
But anyway, so you just need a computer with a

364

00:18:40.400 --> 00:18:43.200
mouse explain. There's a

365
00:18:43.200 --> 00:18:46.300
demo online download it. It's free.

366
00:18:46.300 --> 00:18:49.400
The only the only hiccup is it only last 10

367
00:18:49.400 --> 00:18:50.800
minutes and then it quits

368
00:18:51.600 --> 00:18:54.600
but that's okay for all the takeoff testing and

369
00:18:54.600 --> 00:18:57.600
all the climb testing. You can get done in 10 minutes

370
00:18:57.600 --> 00:19:00.400
and then just restart it. So it's it's not it's not

371
00:19:00.400 --> 00:19:03.500
a huge big deal, but for the cruise testing

372
00:19:03.500 --> 00:19:06.900
that condition lasts a little bit longer so you can buy the fly

373
00:19:06.900 --> 00:19:09.700
to learn commercial version of that

374
00:19:09.700 --> 00:19:11.700
for 15 bucks or something.

375
00:19:12.700 --> 00:19:15.500
As other software you can

376
00:19:15.500 --> 00:19:18.300
use Excel it's not as easy as

377
00:19:18.300 --> 00:19:22.400
dat plot, which is free and that

378
00:19:21.400 --> 00:19:24.200
produces the strip chart data that you saw

379
00:19:24.200 --> 00:19:24.400
earlier.

380
00:19:25.500 --> 00:19:28.600
As far as the instructional resources they're available

381
00:19:28.600 --> 00:19:31.500
on Seattle sft.org website.

382
00:19:32.400 --> 00:19:35.700
They are the videos themselves. So

383
00:19:35.700 --> 00:19:38.500
there's videos of each of the lessons. There's

384
00:19:38.500 --> 00:19:41.600
lesson plans there and there's a study

385
00:19:41.600 --> 00:19:44.700
guide kind of a textbook that's as on

386
00:19:44.700 --> 00:19:47.400
in a PDF file as well. So just help

387
00:19:47.400 --> 00:19:47.700
yourself.

388
00:19:49.600 --> 00:19:52.900
And that is the the companion textbook there

389
00:19:52.900 --> 00:19:54.300
again. It's downloadable.

390
00:19:57.300 --> 00:20:00.900
Within the at the back end of the the

391

00:20:00.900 --> 00:20:03.400
textbook there. I put in a section called flight

392
00:20:03.400 --> 00:20:04.100
test stories.

393
00:20:05.900 --> 00:20:08.400
You know, there's there's when you talk to these students

394
00:20:08.400 --> 00:20:11.500
and or when they listen to you actually when

395
00:20:11.500 --> 00:20:14.800
they listen to you, they are actually enamored it's some

396
00:20:14.800 --> 00:20:18.300
of the things that goes on in Flight testing and

397
00:20:17.300 --> 00:20:20.100
you know, it doesn't have to be the you know,

398
00:20:20.100 --> 00:20:23.300
I almost died or whatever is just the normal

399
00:20:23.300 --> 00:20:26.500
things that happen in flight test that kind

400
00:20:26.500 --> 00:20:29.300
of captures the human element of what

401
00:20:29.300 --> 00:20:32.300
happens in a pre-flight what happens during a flight what happens

402
00:20:32.300 --> 00:20:36.100
during a remote test, you know, the the camaraderie

403
00:20:35.100 --> 00:20:38.300
the the, you know, the things that

404
00:20:38.300 --> 00:20:41.300
happen the funny things that happen. So anyway,

405
00:20:41.300 --> 00:20:44.500
so I start compiling some of these there and and I've

406
00:20:44.500 --> 00:20:47.600
I've got I've written a primer. So so all

407
00:20:47.600 --> 00:20:50.200
the students kind of know what a flight test airplane looks like

408
00:20:50.200 --> 00:20:53.400
and what are pre-flight is and what a post flight is

409
00:20:53.400 --> 00:20:57.000
and you know, and what a test conductor is so they so that's

410
00:20:56.400 --> 00:20:59.200
already kind of set in there.

411
00:20:59.200 --> 00:21:02.800
So and then I that is some of my own experiences of

412
00:21:02.800 --> 00:21:04.500
interesting happenings.

413
00:21:05.600 --> 00:21:08.200
Um, and I wrote them, you know, we're not trying to

414
00:21:08.200 --> 00:21:11.400
embarrass the company or a person or whatever, you know,

415
00:21:11.400 --> 00:21:14.700
we sent it. It's sanitized to you know, no industry

416
00:21:14.700 --> 00:21:15.400
secrets.

417
00:21:16.200 --> 00:21:20.400
But anyway, if any of you would like to contribute let

418

00:21:19.400 --> 00:21:22.200
me know. You can write something up

419
00:21:22.200 --> 00:21:23.400
all interview you.

420
00:21:24.100 --> 00:21:27.400
I'll send you what I have and then we can incorporate that. But anyway, it's

421
00:21:27.400 --> 00:21:30.200
a lot of there's I know the things that we

422
00:21:30.200 --> 00:21:32.300
say at the you know at the bar those stories.

423
00:21:33.000 --> 00:21:33.300
anyway

424
00:21:34.400 --> 00:21:34.900
so basically

425
00:21:36.100 --> 00:21:40.000
Here's the you know tried out for free. It's all

426
00:21:39.700 --> 00:21:42.500
it's all there on our website.

427
00:21:43.900 --> 00:21:46.500
You know kind of in summary

428
00:21:46.500 --> 00:21:46.700
here.

429
00:21:47.900 --> 00:21:50.500
You know, we feel that the source

430
00:21:50.500 --> 00:21:53.600
of meaningful authentic Aerospace projects

431
00:21:53.600 --> 00:21:54.000

for students.

432
00:21:55.100 --> 00:21:58.700
It's got all the the material wherewithal to

433
00:21:58.700 --> 00:22:02.300
to get people started and and

434
00:22:01.300 --> 00:22:04.400
I think it's just a satisfying way to share the

435
00:22:04.400 --> 00:22:07.500
fascinating flight test experience with students.

436
00:22:07.500 --> 00:22:11.100
So I offer I offer this to anybody.

437
00:22:10.100 --> 00:22:13.100
So if you know a teacher

438
00:22:13.100 --> 00:22:16.500
if you know student if you know a parent that wants to do the homeschool

439
00:22:16.500 --> 00:22:19.100
thing help yourself, you're more than

440
00:22:19.100 --> 00:22:20.300
welcome to this.

441
00:22:21.200 --> 00:22:24.600
I will offer I will help I will help you out so we

442
00:22:24.600 --> 00:22:27.300
can do a we can do Zoom meeting

443
00:22:27.300 --> 00:22:30.300
again on the phone or whatever to help you get going

444
00:22:30.300 --> 00:22:33.900
to start it. And I offer all offer this

445
00:22:33.900 --> 00:22:36.900
also to sctp leadership

446
00:22:36.900 --> 00:22:39.300
if they want to, you know include this

447
00:22:39.300 --> 00:22:42.500
in their stem outreach program. They're more than

448
00:22:42.500 --> 00:22:42.900
welcome to.

449
00:22:43.700 --> 00:22:44.700
To that as well.

450
00:22:46.500 --> 00:22:51.100
So just a little shout out to the Seattle chapter there.

451
00:22:50.100 --> 00:22:53.500
We made stem

452
00:22:53.500 --> 00:22:56.100
Outreach and importance a chapter goal there

453
00:22:56.100 --> 00:22:59.200
and over the years. We've provided guest speakers

454
00:22:59.200 --> 00:23:02.500
to classrooms assisted teachers with their project

455
00:23:02.500 --> 00:23:05.400
development. We provided industry experts

456
00:23:05.400 --> 00:23:09.700
for judges, you know mentors for

457
00:23:09.700 --> 00:23:12.600
for students. We hold sfte meetings

458
00:23:12.600 --> 00:23:16.900

at the school. In fact, this project sft

459
00:23:15.900 --> 00:23:18.700
members are Judges.

460
00:23:20.400 --> 00:23:23.600
And let me tell you as as both a

461
00:23:23.600 --> 00:23:24.500
judge and a teacher.

462
00:23:25.500 --> 00:23:26.500
when you

463
00:23:27.400 --> 00:23:30.800
tell the students that you know, a teacher

464
00:23:30.800 --> 00:23:33.400
is not going to judge your project. No, we're

465
00:23:33.400 --> 00:23:33.600
going to get

466
00:23:35.400 --> 00:23:38.300
flight tests my flight test pilots and flight test

467
00:23:38.300 --> 00:23:39.300
Engineers from Seattle.

468
00:23:40.300 --> 00:23:44.000
They come they are going to judge your project what

469
00:23:43.400 --> 00:23:45.100
that does to the students.

470
00:23:46.100 --> 00:23:49.900
It ratches up the bar it raises the bar. So

471
00:23:49.900 --> 00:23:52.200
they know they know they may be as a

472
00:23:52.200 --> 00:23:54.700
teacher or whatever, but they know they're not going to be SS.

473
00:23:56.300 --> 00:23:59.200
So anyway, so anyway, so

474
00:23:59.200 --> 00:24:02.800
we you know, I really appreciate the help, you

475
00:24:02.800 --> 00:24:05.700
know, Kevin Welch, you know, Derek McDonald Bobby

476
00:24:05.700 --> 00:24:09.900
schline, you know, all the you know, the Seattle chapter

477
00:24:08.900 --> 00:24:11.300
officers or whatever.

478
00:24:11.300 --> 00:24:12.900
I really appreciate their support.

479
00:24:14.800 --> 00:24:15.100
so anyway

480
00:24:17.100 --> 00:24:20.200
there that will take you that QR code will take

481
00:24:20.200 --> 00:24:21.400
you to the website.

482
00:24:22.400 --> 00:24:23.900
Are there any questions?