

1

00:00:00,000 --> 00:00:06,840

MUSIC

2

00:00:06,840 --> 00:00:09,840

MUSIC

3

00:00:09,840 --> 00:00:14,720

On this episode, the mythbusters indulge their sweet tooth.

4

00:00:14,720 --> 00:00:15,320

OK.

5

00:00:15,320 --> 00:00:18,720

But will they be burned by an exploding jawbreaker?

6

00:00:18,720 --> 00:00:19,720

Ah!

7

00:00:19,720 --> 00:00:21,120

Woo!

8

00:00:21,120 --> 00:00:23,200

They show true grit.

9

00:00:23,200 --> 00:00:23,920

I'm going to go.

10

00:00:23,920 --> 00:00:26,720

Finding out if a sand blaster can really create

11

00:00:26,720 --> 00:00:28,600

a deadly static cannon.

12

00:00:28,600 --> 00:00:29,600

Ah!

13

00:00:29,600 --> 00:00:31,600

Stop smudging my...

14

00:00:31,600 --> 00:00:35,600

And it's the deal of a lifetime as they play a hand

15

00:00:35,600 --> 00:00:37,600

with the killer deck.

16

00:00:37,600 --> 00:00:38,600

Hey, we drew blood.

17

00:00:38,600 --> 00:00:40,600

MUSIC

18

00:00:40,600 --> 00:00:42,600

Who are the mythbusters?

19

00:00:42,600 --> 00:00:44,600

Adam Savage.

20

00:00:44,600 --> 00:00:47,600

I reject your reality and substitute my own.

21

00:00:47,600 --> 00:00:48,600

And Jamie Heineman.

22

00:00:48,600 --> 00:00:49,600

I kind of like it in here.

23

00:00:49,600 --> 00:00:50,600

It's private.

24

00:00:50,600 --> 00:00:55,600

Between them, more than 30 years special effects experience.

25

00:00:55,600 --> 00:00:57,600

That was intense.

26

00:00:57,600 --> 00:01:00,600

But what do the mythbusters tell the myths?

27

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

They put them to the test.

28

00:01:03,600 --> 00:01:07,600

MUSIC

29

00:01:07,600 --> 00:01:09,600

Jawbreakers.

30

00:01:09,600 --> 00:01:10,600

They're colorful.

31

00:01:10,600 --> 00:01:11,600

They're delicious.

32

00:01:11,600 --> 00:01:13,600

And they're fun.

33

00:01:13,600 --> 00:01:16,600

We doing a sperm in here or we screwing around.

34

00:01:16,600 --> 00:01:22,600

But what could turn this simple candy into a potential bomb?

35

00:01:22,600 --> 00:01:23,600

Ah!

36

00:01:23,600 --> 00:01:24,600

Woo!

37

00:01:24,600 --> 00:01:30,600

MUSIC

38

00:01:30,600 --> 00:01:32,600

Exploding Jawbreaker.

39

00:01:32,600 --> 00:01:33,600

We know this happened.

40

00:01:33,600 --> 00:01:34,600

We just don't know why.

41

00:01:34,600 --> 00:01:36,600

Yeah, we have the police reports and everything.

42

00:01:36,600 --> 00:01:40,600

A treat for five-year-old Cameron D. Hall turned into a scary moment

43

00:01:40,600 --> 00:01:42,600

after just one lick.

44

00:01:42,600 --> 00:01:44,600

And it just blew.

45

00:01:44,600 --> 00:01:45,600

That fast.

46

00:01:45,600 --> 00:01:46,600

Boom.

47

00:01:46,600 --> 00:01:48,600

And he had this jawbreaker in his hand.

48

00:01:48,600 --> 00:01:51,600

And he went down the lick when he did it, it exploded.

49

00:01:51,600 --> 00:01:54,600

The child heated the candy in the microwave.

50

00:01:54,600 --> 00:01:57,600

There's another exploding jawbreaker story in Florida.

51

00:01:57,600 --> 00:02:00,600

The story of nine-year-old Taquandra Dick was burnt

52

00:02:00,600 --> 00:02:03,600

when her jawbuster exploded in 2003.

53

00:02:03,600 --> 00:02:05,600

Hot liquid burned her face.

54

00:02:05,600 --> 00:02:06,600

It hurts.

55

00:02:06,600 --> 00:02:08,600

It hurts a bunch.

56

00:02:08,600 --> 00:02:10,600

She went to lick it.

57

00:02:10,600 --> 00:02:13,600

And at that point the jawbreaker exploded in her face,

58

00:02:13,600 --> 00:02:16,600

leaving really severe burns on her face and on her arm

59

00:02:16,600 --> 00:02:19,600

that were described later as chemical burns.

60

00:02:19,600 --> 00:02:23,600

Jawbreakers start life as a solid candy center.

61

00:02:23,600 --> 00:02:28,600

Then they grow like a snowball as sugar syrup is applied layer after layer

62

00:02:28,600 --> 00:02:31,600

in a process that takes five days.

63

00:02:31,600 --> 00:02:34,600

This is the perfect Mythbusters story.

64

00:02:34,600 --> 00:02:37,600

A hint of truth, sweet things to play with,

65

00:02:37,600 --> 00:02:41,600

and an excuse to do really stupid, dangerous experiments.

66

00:02:41,600 --> 00:02:43,600

Don't try this at home.

67

00:02:43,600 --> 00:02:47,600

We have to come up with a heating and cooling regimen

68

00:02:47,600 --> 00:02:51,600

to determine which scenario, if any, would make these jawbreakers explode.

69

00:02:51,600 --> 00:02:55,600

And really the first place to start is to try and superheat it

70

00:02:55,600 --> 00:02:57,600

and see what happens to the insides.

71

00:02:57,600 --> 00:03:00,600

And superheating means microwaves.

72

00:03:00,600 --> 00:03:05,600

It's obviously a bad idea to put a jawbreaker into your microwave at home,

73

00:03:05,600 --> 00:03:08,600

but the Mythbusters are willing to do it for science.

74

00:03:08,600 --> 00:03:09,600

Look at that.

75

00:03:09,600 --> 00:03:12,600

Oh, God, look at that. There's a hole right in the side of it.

76

00:03:12,600 --> 00:03:14,600

When you're dealing with superheated sugar,

77

00:03:14,600 --> 00:03:17,600

you don't take any chances.

78

00:03:17,600 --> 00:03:20,600

Nope, nothing explosive there.

79

00:03:20,600 --> 00:03:25,600

To suck through a jawbreaker this size could take five days.

80

00:03:25,600 --> 00:03:29,600

So Jamie and Christine use a shortcut to see what's inside.

81

00:03:29,600 --> 00:03:31,600

That's pretty.

82

00:03:31,600 --> 00:03:34,600

The first thing that I noticed when I cut this open is that there's a potential

83

00:03:34,600 --> 00:03:36,600

for a temperature differential.

84

00:03:36,600 --> 00:03:40,600

Temperature differential means a layer inside the jawbreaker

85

00:03:40,600 --> 00:03:43,600

could heat more rapidly than the hard outer shell.

86

00:03:44,600 --> 00:03:49,600

The layer would then expand, creating internal pressure and instability.

87

00:03:49,600 --> 00:03:54,600

If somebody nibbled on a jawbreaker in this state, it could crack.

88

00:03:54,600 --> 00:03:59,600

The molten candy would burst out and cause painful burns.

89

00:03:59,600 --> 00:04:03,600

With the slightest, you know, messing with it, it would go off like a bomb.

90

00:04:03,600 --> 00:04:07,600

The Mythbusters don't really want a mouthful of boiling candy.

91

00:04:07,600 --> 00:04:12,600

So Adam comes up with a toothy solution for Tari to construct.

92

00:04:12,600 --> 00:04:17,600

We have to build a fake mouth to chew on a gobstubby.

93

00:04:17,600 --> 00:04:23,600

We want it to be able to chew, which means the lower jaw will be the hinged part.

94

00:04:23,600 --> 00:04:26,600

The upper jaw will be fixed, like in the head.

95

00:04:26,600 --> 00:04:32,600

If you're building an artificial mouth, the first thing you need is teeth.

96

00:04:32,600 --> 00:04:36,600

Let's hope Adam's granny doesn't miss those dentures too much.

97

00:04:37,600 --> 00:04:44,600

As Adam plays dentist, Tari constructs a steel frame to support the test jaws.

98

00:04:44,600 --> 00:04:47,600

Anyone gonna need candy?

99

00:04:47,600 --> 00:04:52,600

The average human has a maximum bite force of about 170 pounds.

100

00:04:52,600 --> 00:04:57,600

This guy's not average, but our artificial mouth has to be.

101

00:04:57,600 --> 00:05:00,600

So how do we measure its bite force?

102

00:05:01,600 --> 00:05:06,600

What I've done is I've hooked up this force gauge to this device,

103

00:05:06,600 --> 00:05:11,600

and this will give us an accurate reading of how much the jaw exerts.

104

00:05:12,600 --> 00:05:17,600

The digital force gauge measures and displays the peak amount of force applied to it.

105

00:05:20,600 --> 00:05:23,600

Time to test the artificial jaws.

106

00:05:23,600 --> 00:05:29,600

By pushing down on the flexible steel rod, Tari can apply tremendous force onto the dentures.

107

00:05:30,600 --> 00:05:32,600

Maybe too much.

108

00:05:42,600 --> 00:05:44,600

He shouldn't eat hard candy.

109

00:05:45,600 --> 00:05:48,600

This job calls for teeth of steel.

110

00:05:48,600 --> 00:05:50,600

I'm about to cut some canine.

111

00:05:51,600 --> 00:05:55,600

Varying diameter steel rods are cut into tooth-sized pieces.

112

00:05:56,600 --> 00:06:00,600

They're shaped on a grinder and welded onto a steel jaw.

113

00:06:02,600 --> 00:06:05,600

They might not get you a Hollywood contract,

114

00:06:05,600 --> 00:06:10,600

but these steel choppers will be able to replicate the bite pressure of a real mouth.

115

00:06:10,600 --> 00:06:13,600

I've finished the teeth. I hope they work.

116

00:06:14,600 --> 00:06:17,600

Meanwhile, the microwave's getting a workout.

117

00:06:17,600 --> 00:06:23,600

Now look at this. The one light green layer in the middle there started to bubble and nothing else did.

118

00:06:24,600 --> 00:06:27,600

I'll put this piece back in there without the core in the middle of it

119

00:06:27,600 --> 00:06:31,600

and see whether it just kind of pools and nothing else happens.

120

00:06:32,600 --> 00:06:38,600

Christine uses an infrared thermometer to measure the temperature of the candy's molten inner core.

121

00:06:38,600 --> 00:06:39,600

25 degrees.

122

00:06:39,600 --> 00:06:41,600

Yeah, went up to 225.

123

00:06:41,600 --> 00:06:48,600

Well, you know, this is actually pretty interesting because it's clear that it is reacting in that layer a lot more than the surrounding areas.

124

00:06:48,600 --> 00:06:51,600

And that's where we get some kind of an explosion.

125

00:06:51,600 --> 00:06:54,600

Ow, really retains the heat.

126

00:06:54,600 --> 00:06:58,600

You could get seriously burned with this. In fact, I think I did.

127

00:06:58,600 --> 00:07:04,600

So, heating a jawbreaker in the microwave can create a dangerous molten sugar center.

128

00:07:05,600 --> 00:07:07,600

Now to apply pressure.

129

00:07:07,600 --> 00:07:09,600

You want to get me a jawbreaker to test?

130

00:07:09,600 --> 00:07:15,600

Jamie loads up, Adam pushes down, and the steel teeth start chomping.

131

00:07:15,600 --> 00:07:18,600

All right, that's a full bite. Nothing's going on.

132

00:07:19,600 --> 00:07:23,600

They try again, but the jawbreakers just won't crack.

133

00:07:23,600 --> 00:07:27,600

Maybe the boys are heating the candies too fast.

134

00:07:27,600 --> 00:07:28,600

What's the solution?

135

00:07:28,600 --> 00:07:32,600

Deep-frozz cycle. See if we can figure it out on this machine.

136

00:07:34,600 --> 00:07:36,600

Okay, so...

137

00:07:36,600 --> 00:07:40,600

You could do, I think it might be power level one.

138

00:07:40,600 --> 00:07:41,600

Oh.

139

00:07:42,600 --> 00:07:46,600

All they have to do is figure out how to program the microwave.

140

00:07:46,600 --> 00:07:47,600

It's too smart.

141

00:07:47,600 --> 00:07:49,600

Point one pound. That's probably a good bet.

142

00:07:49,600 --> 00:07:51,600

We don't have the manual for this anywhere.

143

00:07:51,600 --> 00:07:55,600

Probably somewhere, but I think that's sort of what it does.

144

00:07:55,600 --> 00:07:59,600

30 years special effects experience finally pays off.

145

00:07:59,600 --> 00:08:02,600

There we go. Start.

146

00:08:02,600 --> 00:08:04,600

That was crazy.

147

00:08:04,600 --> 00:08:06,600

It's like watching paint dry.

148

00:08:06,600 --> 00:08:11,600

Nope, after all that, the defrost setting doesn't do it either.

149

00:08:11,600 --> 00:08:17,600

They test combination after combination of heating, cooling, and pressure.

150

00:08:17,600 --> 00:08:21,600

Until Eureka finally they think they have it.

151

00:08:21,600 --> 00:08:23,600

Going hot on the candy.

152

00:08:23,600 --> 00:08:24,600

Okay.

153

00:08:24,600 --> 00:08:30,600

A highly unstable jawbreaker with a core of molten sugar is about to be crashed.

154

00:08:30,600 --> 00:08:32,600

Two, one.

155

00:08:36,600 --> 00:08:37,600

Ice water over here.

156

00:08:37,600 --> 00:08:39,600

I got it on my own.

157

00:08:39,600 --> 00:08:42,600

Christine's being hit in the face.

158

00:08:48,600 --> 00:08:50,600

I got burned by the candy.

159

00:08:50,600 --> 00:08:54,600

I wasn't wearing a face mask like I should have been.

160

00:08:54,600 --> 00:08:57,600

And I couldn't protect myself with my hands.

161

00:08:57,600 --> 00:09:06,600

At upwards of 225 degrees and with high heat retention, the liquid candy is extremely painful.

162

00:09:06,600 --> 00:09:08,600

Okay, I've got first-hand experience though.

163

00:09:08,600 --> 00:09:09,600

Doesn't feel good.

164

00:09:09,600 --> 00:09:12,600

I got the side of my neck and my temple.

165

00:09:12,600 --> 00:09:14,600

So it hurts.

166

00:09:14,600 --> 00:09:24,600

So the MythBusters have conclusively proved that jawbreaker plus microwave plus steel teeth equals scalded myth turn.

167

00:09:24,600 --> 00:09:30,600

If you were a five-year-old kid and this went off in your face, there's no doubt it would leave serious burns on you.

168

00:09:30,600 --> 00:09:34,600

I could feel it like 10 seconds, 15 seconds later, it wasn't cooling down.

169

00:09:34,600 --> 00:09:35,600

It's like a napalm.

170

00:09:35,600 --> 00:09:37,600

It's very dangerous.

171

00:09:37,600 --> 00:09:40,600

For now, the MythBusters will lick their wounds.

172

00:09:40,600 --> 00:09:45,600

But they'll take a few more bites at this myth before they're finished.

173

00:09:50,600 --> 00:09:53,600

It's a myth to make your hair stand on end.

174

00:09:53,600 --> 00:10:02,600

You think you're just sandblasting a plain old pipe, but are you really creating a massive cannon fueled by static electricity?

175

00:10:05,600 --> 00:10:08,600

This is a really cool story.

176

00:10:08,600 --> 00:10:10,600

Lots and lots of static electricity.

177

00:10:10,600 --> 00:10:11,600

Potentially lethal.

178

00:10:11,600 --> 00:10:12,600

Yes.

179

00:10:12,600 --> 00:10:19,600

The story goes that there's a construction worker who's on a site and he finds a piece of 8-inch diameter PVC pipe.

180

00:10:19,600 --> 00:10:27,600

It's kind of messed up and he wants to reuse it on the job, so he drags it over into the paint area and begins to sandblast it with a large industrial sandblaster.

181

00:10:27,600 --> 00:10:30,600

What he doesn't realize is that that builds a charge up on the pipe.

182

00:10:30,600 --> 00:10:38,600

And as he walks around the pipe to go get another tool, the pipe unloads all of its static electricity into him, killing him instantly.

183

00:10:38,600 --> 00:10:40,600

Like a static cannon.

184

00:10:40,600 --> 00:10:42,600

A static cannon.

185

00:10:42,600 --> 00:10:44,600

What a blast.

186

00:10:44,600 --> 00:10:55,600

To test this one, the MythBusters will need a length of PVC pipe, a sandblaster to build up a charge, a willing victim to get zapped, and a meter to measure the jolt.

187

00:10:55,600 --> 00:11:02,600

It turns out that the ideal conditions for static electricity are very dry conditions, because the moisture in the air inhibits the build up of static.

188

00:11:02,600 --> 00:11:06,600

So I think we're actually really going to want to seal off that area which we're already doing for the sandblasting.

189

00:11:06,600 --> 00:11:09,600

We're going to want to get that area as dry as possible.

190

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

Tori just couldn't be happier with that idea.

191

00:11:13,600 --> 00:11:16,600

It's not like we're housing the boy in the bubble.

192

00:11:16,600 --> 00:11:20,600

A whole workshop of the building is going to be built up in the middle of the building.

193

00:11:20,600 --> 00:11:23,600

It's not like we're housing the boy in the bubble.

194

00:11:23,600 --> 00:11:30,600

A whole workshop to wrap in plastic on his own, just him and his stapler.

195

00:11:30,600 --> 00:11:33,600

He'll take a little while.

196

00:11:33,600 --> 00:11:40,600

So in the meantime, Jamie and Adam seek out a little expert opinion.

197

00:11:40,600 --> 00:11:44,600

Susie C has been an electrical engineer for 15 years.

198

00:11:44,600 --> 00:11:49,600

So Susie, tell me how electrostatic charges would build up on this PVC.

199

00:11:49,600 --> 00:11:55,600

Jamie, as you know, PVC is an excellent insulator. It doesn't like to give off electrons.

200

00:11:55,600 --> 00:12:06,600

So when you rub something along PVC with a lot of friction, electrons build up on the PVC surface and the surface becomes negatively charged.

201

00:12:06,600 --> 00:12:13,600

So PVC can collect a charge, but Susie's never heard of that charge causing problems.

202

00:12:13,600 --> 00:12:20,600

PVC is not conductive. It's very resistive. It can store a charge of electrons.

203

00:12:20,600 --> 00:12:28,600

But can that charge be dissipated so that the current flows and somebody is hurt?

204

00:12:28,600 --> 00:12:30,600

I'm not sure that's possible.

205

00:12:30,600 --> 00:12:35,600

If it is possible, the mythbusters want to be the ones to make it happen.

206

00:12:36,600 --> 00:12:45,600

Back in the workshop, Tari's plastic tent is done and they're spreading painters desiccant.

207

00:12:45,600 --> 00:12:48,600

It draws moisture out of the air.

208

00:12:48,600 --> 00:12:55,600

Now the pipe, nothing like a little PVC overkill to get the sparks flying.

209

00:12:55,600 --> 00:12:58,600

Jamie, I see a problem right away with this myth.

210

00:12:59,600 --> 00:13:07,600

I mean, they said they'd put it up on jack stands, but the problem is we're trying to build up a static charge on something that's grounded to metal.

211

00:13:07,600 --> 00:13:09,600

Yeah, I agree. This wouldn't work at all this way.

212

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

What they need is a little insulation inspiration.

213

00:13:13,600 --> 00:13:19,600

The best I can come up with is to put it on these glass blocks. So I'm going to make a brace to hold them like so.

214

00:13:19,600 --> 00:13:22,600

This is the size of the tube. Hopefully that'll work.

215

00:13:29,600 --> 00:13:31,600

Okay, lower it down.

216

00:13:33,600 --> 00:13:37,600

So the air's dry and the cannon's insulated.

217

00:13:37,600 --> 00:13:41,600

Now, who wants to be blasted with a fatal charge?

218

00:13:41,600 --> 00:13:43,600

Come on, hands up.

219

00:13:45,600 --> 00:13:48,600

I built this hand about 13 years ago.

220

00:13:48,600 --> 00:13:52,600

It was my first attempt at some type of animatronics.

221

00:13:52,600 --> 00:13:56,600

I just had some copper plate and some springs and I put this together.

222

00:13:56,600 --> 00:14:01,600

So I think that this hand actually contributed to me getting my very first job with Jamie.

223

00:14:01,600 --> 00:14:04,600

I think he liked the animatronic aspect of it.

224

00:14:04,600 --> 00:14:09,600

He just knew it would come in handy again someday. The perfect stand-in.

225

00:14:09,600 --> 00:14:14,600

Better copper finger cops the blast than Adam's own.

226

00:14:14,600 --> 00:14:20,600

I am being a little cautious with this rig. I don't know how much electricity is going to generate.

227

00:14:20,600 --> 00:14:27,600

My thinking is, is it's not going to generate very much, but we've been surprised on Mythbusters before

228

00:14:27,600 --> 00:14:31,600

and I don't want to be at the business end of a bad mistake.

229

00:14:32,600 --> 00:14:36,600

To load the cannon, they'll sandblast the pipe end to end.

230

00:14:37,600 --> 00:14:45,600

Jamie will measure the charge buildup on a voltmeter and there's an ammeter in Adam's hand connected to Christine's computer.

231

00:14:46,600 --> 00:14:51,600

After we feel like we've leveled it out to the maximum charge, you'll touch it with this

232

00:14:51,600 --> 00:14:55,600

and Christine can tell us what the amperage spike is and if it's, you know, we can take a look and see if it's enough

233

00:14:55,600 --> 00:14:57,600

to actually cause some real damage.

234

00:14:57,600 --> 00:15:04,600

In cases of electrocution, the damage is done by the current flowing through you, measured in amps.

235

00:15:04,600 --> 00:15:08,600

You can feel one thousandth of an amp or one milliamp.

236

00:15:08,600 --> 00:15:11,600

Up to five will give you a little shock.

237

00:15:11,600 --> 00:15:16,600

Between there and 30 milliamps will be a severe jolt and affect muscle control.

238

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

Getting beyond 50, it can affect breathing and heartbeat and can prove fatal.

239

00:15:26,600 --> 00:15:30,600

But can their static cannon produce a massive fatal blast?

240

00:15:32,600 --> 00:15:34,600

Okay, I'm going to go.

241

00:15:38,600 --> 00:15:43,600

By bombarding the pipe with sand, Adam is loading it up with millions of electrons.

242

00:15:47,600 --> 00:15:53,600

It could discharge when they touch it with the copper hand or, as in the myth, completely at random.

243

00:15:59,600 --> 00:16:01,600

Let's see where it is now.

244

00:16:03,600 --> 00:16:06,600

Went back down again. That's like 500 volts.

245

00:16:06,600 --> 00:16:11,600

Something weird is happening. The static charge has actually dropped.

246

00:16:12,600 --> 00:16:17,600

This is a big piece of plastic, so we should be able to create a big charge.

247

00:16:17,600 --> 00:16:20,600

Why we're not at this point, I'm not so sure.

248

00:16:20,600 --> 00:16:22,600

And here's another problem.

249

00:16:22,600 --> 00:16:26,600

Adam's got gas, or at least the blaster does.

250

00:16:31,600 --> 00:16:33,600

So here's the unit.

251

00:16:34,600 --> 00:16:37,600

Maybe that we don't know how to use it, it may be that it's not working right.

252

00:16:37,600 --> 00:16:40,600

It seems for blasting, there's the right sand.

253

00:16:40,600 --> 00:16:43,600

And there's the kind the mythbusters bought.

254

00:16:43,600 --> 00:16:45,600

Yeah, it's catching in the nozzle.

255

00:16:45,600 --> 00:16:52,600

We've got hundreds and hundreds of pounds of sand meant for kids playpen, not for a sand blaster.

256

00:16:55,600 --> 00:16:58,600

Jamie doesn't really buy the whole gritty sand thing.

257

00:16:58,600 --> 00:17:03,600

While Adam is off searching for something finer, a little Heinemann handiwork

258

00:17:03,600 --> 00:17:06,600

gets the mythbusters back in the blasting game.

259

00:17:12,600 --> 00:17:17,600

Jamie's done something right. This time the cannon is charging up.

260

00:17:22,600 --> 00:17:24,600

17,000 volts.

261

00:17:25,600 --> 00:17:27,600

Will that give off a fatal zap?

262

00:17:29,600 --> 00:17:31,600

Okay, Christine, did we catch any amperage?

263

00:17:31,600 --> 00:17:33,600

Nothing, I mean it's just a blank screen.

264

00:17:33,600 --> 00:17:35,600

It doesn't even look like it's connected to anything.

265

00:17:35,600 --> 00:17:36,600

I didn't see a blip.

266

00:17:36,600 --> 00:17:37,600

What are you doing wrong?

267

00:17:37,600 --> 00:17:39,600

Nothing, I swear.

268

00:17:39,600 --> 00:17:41,600

I've been looking at it the whole time.

269

00:17:41,600 --> 00:17:44,600

I got the volts. Where's your amps?

270

00:17:44,600 --> 00:17:46,600

She can't help you.

271

00:17:47,600 --> 00:17:51,600

There's no current, no spark, not even a blip on the screen.

272

00:17:51,600 --> 00:17:54,600

Unless Jamie and Adam can think of something fast,

273

00:17:54,600 --> 00:17:58,600

the only thing this static cannon will blow away will be the myth.

274

00:18:05,600 --> 00:18:07,600

Adam is gambling with his life.

275

00:18:07,600 --> 00:18:09,600

You wimp.

276

00:18:09,600 --> 00:18:12,600

He is an apprentice before the master.

277

00:18:13,600 --> 00:18:14,600

Are you ready?

278

00:18:14,600 --> 00:18:15,600

I'm ready.

279

00:18:15,600 --> 00:18:22,600

This ain't old made. It's the biggest deal of all when you're playing with the killer debt.

280

00:18:24,600 --> 00:18:26,600

This is real.

281

00:18:41,600 --> 00:18:43,600

Killer Deck, this has got to be one of your favorites.

282

00:18:43,600 --> 00:18:45,600

One of my all time favorites actually.

283

00:18:45,600 --> 00:18:51,600

The myth is that an ordinary playing card can be turned into an instrument of death

284

00:18:51,600 --> 00:18:54,600

and actually kill somebody with a powerful throat.

285

00:18:54,600 --> 00:18:57,600

Sounds highly implausible to me.

286

00:18:57,600 --> 00:19:00,600

Be that as it may, you can actually throw these things with a fair amount of force.

287

00:19:00,600 --> 00:19:03,600

I've been doing it since I was like 10 years old.

288

00:19:04,600 --> 00:19:05,600

You're pretty good at that.

289

00:19:06,600 --> 00:19:08,600

Adam's better than pretty good.

290

00:19:08,600 --> 00:19:14,600

He's a card throwing ace and is proud to display the fruits of a mis-spent youth.

291

00:19:14,600 --> 00:19:18,600

The first aspect is just imparting lateral speed to the card.

292

00:19:18,600 --> 00:19:21,600

The second is imparting spin to it.

293

00:19:21,600 --> 00:19:27,600

It's a combination of both of those things that I think yields the most distance and stability.

294

00:19:27,600 --> 00:19:32,600

So all it takes is speed, spin and say 30 years practice.

295

00:19:32,600 --> 00:19:35,600

I haven't had all day to sit around practicing like you guys.

296

00:19:35,600 --> 00:19:37,600

Yeah, that's what I've been doing.

297

00:19:39,600 --> 00:19:44,600

As far as I'm aware, it's not possible to actually kill someone with a playing card by throwing it at them.

298

00:19:44,600 --> 00:19:47,600

I can't try anybody with a playing card.

299

00:19:48,600 --> 00:19:49,600

No way.

300

00:19:50,600 --> 00:19:52,600

I'm sure they're going to try.

301

00:19:54,600 --> 00:19:59,600

The high-speed camera shows Adam in all his mutant ninja glory.

302

00:19:59,600 --> 00:20:04,600

He's hitting that phone block target at an impressive 25 miles an hour.

303

00:20:04,600 --> 00:20:09,600

But when it comes to cards, few can trump Ricky J.

304

00:20:09,600 --> 00:20:14,600

Well, some people have called me the leading hurler of martial projectiles in the world.

305

00:20:14,600 --> 00:20:19,600

Ricky can throw a regular playing card nearly 200 feet.

306

00:20:19,600 --> 00:20:24,600

So yeah, I can just throw one without too much, I've got a little curve, but that'll hit him anyway.

307

00:20:26,600 --> 00:20:28,600

I'll take credit for anything.

308

00:20:29,600 --> 00:20:31,600

Watch closely here.

309

00:20:31,600 --> 00:20:36,600

He's putting a card right through the same hole in the paper as the throw before.

310

00:20:36,600 --> 00:20:37,600

That's it.

311

00:20:38,600 --> 00:20:42,600

And he can cure your smoking habit better than any hypnotist.

312

00:20:45,600 --> 00:20:49,600

When it comes to killer cards, Ricky wrote the book.

313

00:20:49,600 --> 00:20:54,600

Well, Ricky, have you heard the myth about someone being killed with a throwing card?

314

00:20:54,600 --> 00:21:01,600

Well, there's a book called Cards as Weapons, which is a study of self-defense with the ordinary playing card

315

00:21:01,600 --> 00:21:06,600

that deals with some stories of people who may have actually been killed with playing cards.

316

00:21:06,600 --> 00:21:08,600

Now, isn't it true that you wrote this book?

317

00:21:08,600 --> 00:21:10,600

It is true. Yes, I did write that book.

318

00:21:10,600 --> 00:21:13,600

So you may be the genesis of this tale.

319

00:21:13,600 --> 00:21:15,600

I would be surprised if I wasn't.

320

00:21:15,600 --> 00:21:19,600

Lethal cards. Is it true? Ricky's not saying.

321

00:21:20,600 --> 00:21:24,600

Jamie's always crisp shirt is as good as body armor.

322

00:21:24,600 --> 00:21:27,600

Of course, that doesn't mean the myth is dead.

323

00:21:27,600 --> 00:21:34,600

We have some unsubstantiated accounts that world record-holding card throwers like Ricky J.

324

00:21:34,600 --> 00:21:37,600

are throwing the card at almost 90 miles per hour.

325

00:21:37,600 --> 00:21:43,600

Our challenge in this myth is to build a machine that can throw a card as fast as possible.

326

00:21:43,600 --> 00:21:44,600

Let's go for it.

327

00:21:45,600 --> 00:21:47,600

So here's the deal.

328

00:21:47,600 --> 00:21:53,600

The myth musters will build a high-powered card throwing machine and compare it to other weapons.

329

00:21:53,600 --> 00:21:56,600

But son of a gun, you'll never guess.

330

00:21:56,600 --> 00:22:00,600

Adam and Jamie have completely different ideas on how to do it.

331

00:22:03,600 --> 00:22:04,600

Hi, how you doing?

332

00:22:04,600 --> 00:22:08,600

Adam's ambitious plan is a sort of bionic arm.

333

00:22:10,600 --> 00:22:14,600

Jamie's making a kind of mini baseball pitching machine.

334

00:22:18,600 --> 00:22:22,600

Whenever an engineer builds something that's over-complicated,

335

00:22:22,600 --> 00:22:25,600

that's the mark of an inferior designer.

336

00:22:25,600 --> 00:22:28,600

Simpler is always better.

337

00:22:28,600 --> 00:22:30,600

This pulls all the way back.

338

00:22:30,600 --> 00:22:34,600

Something like this spreads and the card flies out.

339

00:22:34,600 --> 00:22:39,600

It's complicated, but just maybe Adam's gizmo will work.

340

00:22:39,600 --> 00:22:40,600

That's actually pretty clever.

341

00:22:47,600 --> 00:22:48,600

What's going on?

342

00:22:50,600 --> 00:22:51,600

Getting worse.

343

00:22:55,600 --> 00:22:58,600

Oh, looks like the fingers are getting tweaked a little bit.

344

00:23:00,600 --> 00:23:02,600

That was pretty cool.

345

00:23:02,600 --> 00:23:04,600

Adam actually had a pretty clever idea.

346

00:23:04,600 --> 00:23:07,600

It doesn't work, but it was really clever.

347

00:23:07,600 --> 00:23:09,600

I'm not very happy with it.

348

00:23:09,600 --> 00:23:14,600

As usual, I've tended to get a little over-elegant in my design.

349

00:23:14,600 --> 00:23:20,600

Over-elegant is apparently engineering speak for it won't work.

350

00:23:20,600 --> 00:23:24,600

Adam is thrown in his hand and it's down to Jamie.

351

00:23:24,600 --> 00:23:27,600

With less elegance, more grunt as his mantra,

352

00:23:27,600 --> 00:23:32,600

this promises to be the most diabolical little machine he's ever created.

353

00:23:37,600 --> 00:23:41,600

Jamie's made what could be a card-throwing monster.

354

00:23:41,600 --> 00:23:42,600

All right.

355

00:23:42,600 --> 00:23:45,600

Yeah, I'm a little scared of this thing myself.

356

00:23:55,600 --> 00:23:57,600

I'm tickled with my design actually.

357

00:23:57,600 --> 00:23:59,600

It came together really quickly.

358

00:23:59,600 --> 00:24:00,600

It's really simple.

359

00:24:00,600 --> 00:24:03,600

And best of all, it just rockets those cards.

360

00:24:03,600 --> 00:24:05,600

I mean, they're just like, gone.

361

00:24:05,600 --> 00:24:07,600

So, that's cool.

362

00:24:07,600 --> 00:24:10,600

Jamie's pitching machine is getting that card out there

363

00:24:10,600 --> 00:24:12,600

at around 70 miles an hour.

364

00:24:13,600 --> 00:24:14,600

Look at that.

365

00:24:14,600 --> 00:24:17,600

I mean, I can definitely say you're going a lot deeper than I can go.

366

00:24:17,600 --> 00:24:21,600

I mean, look, even from here, you know,

367

00:24:21,600 --> 00:24:24,600

you're going like half, burying half the card.

368

00:24:24,600 --> 00:24:26,600

That's an intense amount of speed.

369

00:24:26,600 --> 00:24:27,600

Yeah.

370

00:24:29,600 --> 00:24:32,600

This is becoming quite a dangerous little card-throwing machine.

371

00:24:34,600 --> 00:24:36,600

But maybe for the wrong reasons.

372

00:24:39,600 --> 00:24:40,600

What was that?

373

00:24:42,600 --> 00:24:43,600

Oh, you know what?

374

00:24:44,600 --> 00:24:45,600

Oh, yeah.

375

00:24:45,600 --> 00:24:46,600

Oh.

376

00:24:47,600 --> 00:24:48,600

What happened to it, do you think?

377

00:24:48,600 --> 00:24:50,600

That's going 30,000 RPM.

378

00:24:51,600 --> 00:24:54,600

The small rubber wheels can't handle the speed

379

00:24:54,600 --> 00:24:56,600

and are breaking apart.

380

00:24:57,600 --> 00:24:59,600

It's time to up the ante.

381

00:25:03,600 --> 00:25:08,600

Bigger wheels and the mythbusters will be killer card high rollers.

382

00:25:09,600 --> 00:25:10,600

I'm ready.

383

00:25:10,600 --> 00:25:25,600

That might be the fastest failure we've ever had.

384

00:25:26,600 --> 00:25:29,600

I wouldn't have called that.

385

00:25:29,600 --> 00:25:32,600

Rubber wheels aren't happening on this one.

386

00:25:32,600 --> 00:25:34,600

We have to do it out of metal.

387

00:25:34,600 --> 00:25:39,600

In fact, you know, I have some things that I can bring you out right now

388

00:25:39,600 --> 00:25:41,600

to show you an example of what we can try.

389

00:25:41,600 --> 00:25:46,600

I use these when I made the first Chef Boy Rd commercial in 1948

390

00:25:46,600 --> 00:25:47,600

for the LSD.

391

00:25:47,600 --> 00:25:48,600

I'm a chef.

392

00:25:48,600 --> 00:25:49,600

I'm a chef.

393

00:25:49,600 --> 00:25:50,600

I'm a chef.

394

00:25:50,600 --> 00:25:51,600

I'm a chef.

395

00:25:51,600 --> 00:25:52,600

I'm a chef.

396

00:25:52,600 --> 00:25:53,600

I'm a chef.

397

00:25:53,600 --> 00:25:54,600

I'm a chef.

398

00:25:54,600 --> 00:25:55,600

I'm a chef.

399

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

I'm a chef.

400

00:25:56,600 --> 00:25:57,600

I'm a chef.

401

00:25:57,600 --> 00:25:58,600

I'm a chef.

402

00:25:58,600 --> 00:25:59,600

I'm a chef.

403

00:25:59,600 --> 00:26:00,600

I'm a chef.

404

00:26:00,600 --> 00:26:01,600

I'm a chef.

405

00:26:01,600 --> 00:26:04,600

So, why do you wanna younger people come out in the audience,

406

00:26:04,600 --> 00:26:06,600

instead of early on when they're gonna get waxed,

407

00:26:06,600 --> 00:26:09,600

and finish the defect all over the channel

408

00:26:09,600 --> 00:26:11,600

from being the worst parent for our kids?

409

00:26:14,600 --> 00:26:15,600

You know?

410

00:26:15,600 --> 00:26:17,600

The saunas, the nineties,

411

00:26:17,600 --> 00:26:18,600

the pierwsacks,

412

00:26:18,600 --> 00:26:19,600

and the chessridge.

413

00:26:19,600 --> 00:26:20,600

And, of course,

414

00:26:20,600 --> 00:26:23,500

they're the most spectacular things in the world

415

00:26:23,600 --> 00:26:26,600

against the pandemic in the Middle Ages nine or 15.

416

00:26:26,600 --> 00:26:31,360

Of course, danger is the Mythbusters' constant friend and companion.

417

00:26:31,360 --> 00:26:36,160

And now they have a new toy, the mother of all card-chuckers.

418

00:26:36,160 --> 00:26:38,160

Alright, let's try that.

419

00:26:38,160 --> 00:26:39,660

Let's go.

420

00:26:39,660 --> 00:26:42,660

Everybody eyes open, we're spinning up a big fast thing.

421

00:26:42,660 --> 00:26:44,660

Here we go.

422

00:26:50,500 --> 00:26:52,500

It even sounds dangerous.

423

00:26:52,500 --> 00:26:54,500

I don't want to get near that thing.

424

00:26:54,500 --> 00:26:56,500

I don't need it.

425

00:26:56,500 --> 00:26:58,500

They're serious.

426

00:26:58,500 --> 00:27:00,500

They really don't want to get near it.

427

00:27:00,500 --> 00:27:04,500

But they have to load the cards.

428

00:27:04,500 --> 00:27:06,500

Adam's got a solution.

429

00:27:06,500 --> 00:27:11,500

This, I got when I bought an esophagus scope.

430

00:27:11,500 --> 00:27:13,500

This is for going all the way down.

431

00:27:13,500 --> 00:27:17,500

Ahhhh, ah, ah, ah, I got all the way down to your stomach.

432

00:27:17,500 --> 00:27:20,500

Oh, ah, ah, like that.

433

00:27:20,500 --> 00:27:22,500

I'm pulling it back out again.

434

00:27:22,500 --> 00:27:24,500

Yeah.

435

00:27:24,500 --> 00:27:26,500

You want to try?

436

00:27:26,500 --> 00:27:28,500

I hate this thing.

437

00:27:28,500 --> 00:27:30,500

I know, it's terrifying.

438

00:27:30,500 --> 00:27:32,500

You ready?

439

00:27:32,500 --> 00:27:34,500

Yeah.

440

00:27:34,500 --> 00:27:36,500

I'm ready.

441

00:27:36,500 --> 00:27:38,500

Go ahead.

442

00:27:51,500 --> 00:27:53,500

That was beautiful.

443

00:27:53,500 --> 00:27:56,500

Oh my God.

444

00:27:58,500 --> 00:28:00,500

That's one that I did.

445

00:28:00,500 --> 00:28:02,500

Here's ours.

446

00:28:02,500 --> 00:28:05,500

Embedded like half the card.

447

00:28:05,500 --> 00:28:07,500

Well, we got to see what kind of speed that is.

448

00:28:07,500 --> 00:28:09,500

Yeah.

449

00:28:09,500 --> 00:28:14,500

The high speed tracks that card at a blistering 150 miles an hour.

450

00:28:14,500 --> 00:28:16,500

But even at that speed,

451

00:28:16,500 --> 00:28:19,500

Jamie isn't convinced the card is lethal.

452

00:28:19,500 --> 00:28:23,500

You know, creating a killer playing card isn't just about the speed.

453

00:28:23,500 --> 00:28:25,500

It also involves the mass.

454

00:28:25,500 --> 00:28:29,500

They found out all about the importance of mass in the penny drop myth.

455

00:28:29,500 --> 00:28:31,500

I'm scared.

456

00:28:31,500 --> 00:28:34,500

Jamie built a gun to fire a penny at high speed.

457

00:28:34,500 --> 00:28:36,500

Good. Are we ready?

458

00:28:36,500 --> 00:28:38,500

Ready on him?

459

00:28:38,500 --> 00:28:41,500

The lite coin didn't have any penetrating power.

460

00:28:41,500 --> 00:28:43,500

Ah, what?

461

00:28:43,500 --> 00:28:47,500

You hit me in the same exact place.

462

00:28:47,500 --> 00:28:51,500

It didn't hurt that much before, but now it really hurts.

463

00:28:51,500 --> 00:28:53,500

Oh, you baby.

464

00:28:53,500 --> 00:28:56,500

When you're looking at the mass of a penny here on the scale,

465

00:28:56,500 --> 00:29:00,500

the penny comes out at just a little over three grams.

466

00:29:00,500 --> 00:29:04,500

And a card comes out at just about 1.7 grams.

467

00:29:04,500 --> 00:29:08,500

Yeah, well, nevertheless, I think we need to put this up against some things

468

00:29:08,500 --> 00:29:11,500

that we know can penetrate human flesh.

469

00:29:11,500 --> 00:29:15,500

So out comes the myth busters old friend Ballistics Gel.

470

00:29:15,500 --> 00:29:17,500

I'm going to open up a brand new deck of cards,

471

00:29:17,500 --> 00:29:21,500

so I've got some nice sharp cards for this one.

472

00:29:21,500 --> 00:29:23,500

Here we go.

473

00:29:25,500 --> 00:29:27,500

No.

474

00:29:28,500 --> 00:29:31,500

Hey!

475

00:29:31,500 --> 00:29:35,500

Adam's best effort can only penetrate a quarter of an inch.

476

00:29:35,500 --> 00:29:38,500

But how will the killer deck cut it?

477

00:29:38,500 --> 00:29:41,500

OK, ready when you are.

478

00:29:46,500 --> 00:29:50,500

There we go. That's a hit.

479

00:29:50,500 --> 00:29:56,500

Even at 150 miles an hour, the card only penetrates half an inch.

480

00:29:56,500 --> 00:30:01,500

Now, what about a dangerous, but generally not deadly, pellet gun?

481

00:30:04,500 --> 00:30:08,500

The lead slug is traveling at around 350 miles an hour

482

00:30:08,500 --> 00:30:11,500

and burrowed in seven inches.

483

00:30:11,500 --> 00:30:15,500

And last, well, crossbows, anyone?

484

00:30:16,500 --> 00:30:18,500

That's pretty devastating.

485

00:30:18,500 --> 00:30:24,500

At 200 miles per hour, the heavy crossbow bolt has penetrated 20 inches.

486

00:30:24,500 --> 00:30:27,500

The myth busters have cast their last chip.

487

00:30:27,500 --> 00:30:33,500

The fastest card they can throw lacks the penetrating power of even a humble pellet gun.

488

00:30:33,500 --> 00:30:38,500

Well, all that being said, Jamie, are you willing this time to put your body on the line

489

00:30:38,500 --> 00:30:40,500

and take a hit from the machine?

490

00:30:40,500 --> 00:30:42,500

Yeah, sure, I don't mind.

491

00:30:44,500 --> 00:30:50,500

Well, I think it's only fair to give Adam a chance once in a while to inflict some damage on me.

492

00:30:50,500 --> 00:30:52,500

So it's shirt off.

493

00:30:53,500 --> 00:30:56,500

It's so nice that Jamie's finally doing this instead of me.

494

00:30:56,500 --> 00:30:58,500

Eye protection on.

495

00:30:58,500 --> 00:31:01,500

Look at what a fine specimen of manhood he is for 83.

496

00:31:02,500 --> 00:31:03,500

Here we go.

497

00:31:03,500 --> 00:31:07,500

Jamie is putting his body where his myth busting mouth is.

498

00:31:15,500 --> 00:31:16,500

Really?

499

00:31:16,500 --> 00:31:17,500

Really?

500

00:31:21,500 --> 00:31:27,500

He's taken two for the team, and it seems the killer machine ain't quite so killer.

501

00:31:28,500 --> 00:31:29,500

Does it really?

502

00:31:29,500 --> 00:31:31,500

I figured it might.

503

00:31:31,500 --> 00:31:32,500

Do you have any marks?

504

00:31:32,500 --> 00:31:34,500

Hey, we drew blood!

505

00:31:34,500 --> 00:31:35,500

Look at that!

506

00:31:35,500 --> 00:31:37,500

Excellent, we drew blood with a card.

507

00:31:37,500 --> 00:31:39,500

And there, that was the arm.

508

00:31:39,500 --> 00:31:40,500

Look at that.

509

00:31:40,500 --> 00:31:44,500

I believe that might be your first significant injury on myth busters, Jamie.

510

00:31:44,500 --> 00:31:45,500

Could be.

511

00:31:46,500 --> 00:31:54,500

So unless you can bleed to death from a nasty paper cut, it seems a killer hand will remain a figure of speech.

512

00:31:56,500 --> 00:32:03,500

Well, we fired everything we had in the shop at this piece of ballistics gel, and for the life of me, even from our Uber machine,

513

00:32:03,500 --> 00:32:06,500

I didn't really see anything I thought was lethal from that playing guard.

514

00:32:06,500 --> 00:32:08,500

Yeah, I don't have any problem with that.

515

00:32:08,500 --> 00:32:11,500

I'm willing to say that this myth is pretty busted.

516

00:32:11,500 --> 00:32:13,500

I agree, it doesn't happen in mass.

517

00:32:17,500 --> 00:32:25,500

A treat for five-year-old Cameron D. Hall turned into a scary moment after just one lick.

518

00:32:25,500 --> 00:32:27,500

It just blew.

519

00:32:27,500 --> 00:32:29,500

That fast.

520

00:32:29,500 --> 00:32:32,500

It's the case of the exploding jawbreaker.

521

00:32:32,500 --> 00:32:37,500

How can a common candy become a ticking time bomb?

522

00:32:39,500 --> 00:32:43,500

I can't imagine if a child got hit with candy like that, that was heated like that.

523

00:32:43,500 --> 00:32:45,500

It would be terrible.

524

00:32:45,500 --> 00:32:50,500

Well, Adam, you know, a microwave is clearly the best option for this kind of thing to happen with,

525

00:32:50,500 --> 00:32:54,500

because we know that it did in fact occur with a kid getting his face burned.

526

00:32:54,500 --> 00:32:59,500

Yeah, but, Jamie, I really think we need to look at some other options that might have created some kind of explosion.

527

00:32:59,500 --> 00:33:05,500

And the first thing that comes to mind is a chemical reaction, where some part of the manufacturing process

528

00:33:05,500 --> 00:33:09,500

went awry and left a chemical that reacted with another chemical in the candy.

529

00:33:09,500 --> 00:33:13,500

I think the prime candidate for this would be caustic soda or lye,

530

00:33:13,500 --> 00:33:17,500

which is often used in the cleaning of food processing equipment.

531

00:33:17,500 --> 00:33:20,500

Yeah, lye is pretty reactive. It's powerful stuff.

532

00:33:20,500 --> 00:33:22,500

So let's put that under some heat and see what we get.

533

00:33:22,500 --> 00:33:23,500

Okay.

534

00:33:23,500 --> 00:33:30,500

It's a highly unlikely scenario, but it is possible, and it may cause an explosion.

535

00:33:30,500 --> 00:33:32,500

How could a myth buster resist that?

536

00:33:32,500 --> 00:33:38,500

Four samples are prepared, two contain caustic soda and ground-up jawbreaker,

537

00:33:38,500 --> 00:33:46,500

and two contain caustic soda and ascorbic acid, a common food additive, also known as vitamin C.

538

00:33:46,500 --> 00:33:51,500

Water will be added to one set of samples, heat will be added to the other.

539

00:33:51,500 --> 00:33:53,500

Nothing's happening at all.

540

00:33:53,500 --> 00:33:57,500

But Adam wants a kaboom, and he wants it now.

541

00:33:57,500 --> 00:33:59,500

Let's put him on high for five minutes.

542

00:33:59,500 --> 00:34:03,500

He did. He put it on high for five minutes.

543

00:34:03,500 --> 00:34:08,500

It's really effective for cleaning out the microwave in just a couple of minutes.

544

00:34:08,500 --> 00:34:10,500

Whoa!

545

00:34:10,500 --> 00:34:14,500

Wow! Okay, that would be...

546

00:34:14,500 --> 00:34:16,500

Okay, stop, stop, stop.

547

00:34:16,500 --> 00:34:18,500

Wow, you've made like a burning cupcake.

548

00:34:18,500 --> 00:34:19,500

Well, that was fun.

549

00:34:19,500 --> 00:34:21,500

That's spectacular.

550

00:34:21,500 --> 00:34:27,500

The dry caustic soda and crushed jawbreaker mix proves highly combustible.

551

00:34:27,500 --> 00:34:30,500

Well, it produced a lot of hot ash.

552

00:34:30,500 --> 00:34:35,500

The caustic soda, ascorbic acid, and water mix also proves to be a surprise.

553

00:34:35,500 --> 00:34:37,500

Whoa, that's super hot.

554

00:34:37,500 --> 00:34:39,500

Yes, it is.

555

00:34:39,500 --> 00:34:47,500

I think we should take this last mixture of the caustic soda and the candy powder and put it at the same temperature the jawbreaker was at in the other, the radiant heat.

556

00:34:47,500 --> 00:34:49,500

Okay.

557

00:34:49,500 --> 00:34:55,500

This will approximate a caustic soda-contaminated candy being left out in the sun.

558

00:34:55,500 --> 00:34:56,500

Whoa!

559

00:34:56,500 --> 00:34:59,500

And the result is dramatic.

560

00:34:59,500 --> 00:35:01,500

All right, well...

561

00:35:05,500 --> 00:35:07,500

Glove, glove, glove, glove, glove, glove.

562

00:35:07,500 --> 00:35:09,500

That was spectacular.

563

00:35:09,500 --> 00:35:12,500

That's a handy way to get rid of a paper cup.

564

00:35:12,500 --> 00:35:13,500

Geez.

565

00:35:13,500 --> 00:35:15,500

Look at that, man.

566

00:35:15,500 --> 00:35:16,500

That's crazy.

567

00:35:16,500 --> 00:35:17,500

Feel it.

568

00:35:17,500 --> 00:35:18,500

It's like rock art.

569

00:35:18,500 --> 00:35:20,500

Feel it, feel it.

570

00:35:20,500 --> 00:35:23,500

Are you convinced?

571

00:35:23,500 --> 00:35:35,500

I mean, that radiant heat was enough within just five minutes to make the caustic soda react with the powdered candy and create like an incredible expansion, explosion, flames, everything.

572

00:35:35,500 --> 00:35:37,500

Yeah, I guess that's a possible scenario.

573

00:35:37,500 --> 00:35:48,500

You know, it is conceivable that they could use a caustic soda to clean out the equipment for candy making, and if some of it got with the sugar and it got heated up, obviously it creates a reaction.

574

00:35:48,500 --> 00:36:01,500

Although it's far less likely to occur because manufacturers in the food industry are held to much higher standards than five-year-olds with microwaves, I think this is still a very plausible scenario for exploding jawbreaker.

575

00:36:01,500 --> 00:36:10,500

So the Mythbusters have created jawbreaker explosions with microwaves and with chemicals.

576

00:36:10,500 --> 00:36:13,500

But what if neither of those were involved?

577

00:36:13,500 --> 00:36:19,500

So a key element that keeps popping up in the stories about the exploding jawbreakers is the plastic packaging.

578

00:36:19,500 --> 00:36:35,500

And on the off chance that the packaging itself will somehow focus heat and make the jawbreaker more explosive, I think we should place it under a radiant heat source like a toaster oven and leave it there for a while, see if it actually has any significant effect on the jawbreaker.

579

00:36:36,500 --> 00:36:44,500

Putting the jawbreaker in the toaster oven is like leaving it in the sunshine for a couple of hours, something any kid could accidentally do.

580

00:36:44,500 --> 00:36:45,500

Anything happening yet?

581

00:36:45,500 --> 00:36:46,500

Not yet.

582

00:36:46,500 --> 00:36:52,500

But leaving a candy in the sun couldn't really have any effect. Or could it?

583

00:36:52,500 --> 00:36:55,500

Oh, look, the bag's almost like pillow-like.

584

00:36:55,500 --> 00:36:57,500

Alright, well, let's put them in the jaws.

585

00:36:57,500 --> 00:36:59,500

Okay. In the bag, right?

586

00:36:59,500 --> 00:37:00,500

Yeah.

587

00:37:00,500 --> 00:37:02,500

Are you ready? Is everybody clear?

588

00:37:02,500 --> 00:37:03,500

Yeah.

589

00:37:05,500 --> 00:37:09,500

Nope, that's as hard as a human can bite and I'm getting squat.

590

00:37:09,500 --> 00:37:10,500

Okay.

591

00:37:10,500 --> 00:37:15,500

When he removes the jawbreaker from its plastic wrapper, Jamie is in for a surprise.

592

00:37:15,500 --> 00:37:22,500

Well, actually it is still hard on the outside and it's molten in the middle. That's interesting. I never would have thought it would do that.

593

00:37:22,500 --> 00:37:25,500

I thought the only way we could get that was with the microwave.

594

00:37:25,500 --> 00:37:29,500

Well, under radiant heat, it got molten in the middle and stayed crispy outside.

595

00:37:29,500 --> 00:37:34,500

I think we've come up with three possible scenarios for candy destruction.

596

00:37:34,500 --> 00:37:36,500

This is confirmed, confirmed, confirmed.

597

00:37:36,500 --> 00:37:45,500

Maybe. But what about that other scenario? You know, the one about the evil, genius five-year-old with a bag of gunpowder.

598

00:37:45,500 --> 00:37:46,500

It's kind of cute.

599

00:37:46,500 --> 00:37:51,500

Cute but deadly. The jawbreaker from hell.

600

00:37:51,500 --> 00:37:58,500

How likely is this scenario depends on whether or not you live in the real world or Wiley Coyote's world?

601

00:37:58,500 --> 00:38:03,500

Because I can imagine a child licking on a ball with a fuse that's going on.

602

00:38:03,500 --> 00:38:10,500

This scenario doesn't really have anything to do with this, with what we understand happened in the stories. We're just doing it for fun.

603

00:38:10,500 --> 00:38:12,500

Let the fun begin.

604

00:38:12,500 --> 00:38:15,500

Three, two, one.

605

00:38:18,500 --> 00:38:20,500

Just chat amongst yourselves a moment.

606

00:38:20,500 --> 00:38:22,500

Nothing's happening.

607

00:38:24,500 --> 00:38:25,500

Can we get a fresh battery?

608

00:38:25,500 --> 00:38:26,500

Take two.

609

00:38:26,500 --> 00:38:27,500

Okay, we're ready?

610

00:38:27,500 --> 00:38:28,500

Give it a kept up, please.

611

00:38:28,500 --> 00:38:32,500

And three, two, one.

612

00:38:34,500 --> 00:38:38,500

That was a nice boom.

613

00:38:38,500 --> 00:38:44,500

It's like a magic trick. It's like, watch me make half the ball disappear.

614

00:38:47,500 --> 00:38:53,500

Well, that is an exploding jawbreaker. I think we have examined every last way you could get candy to explode.

615

00:38:53,500 --> 00:38:55,500

And a few ways that they can't.

616

00:38:55,500 --> 00:38:58,500

That's it then. I mean, all our scenarios paid out and were possible.

617

00:38:58,500 --> 00:39:00,500

Myth totally confirmed.

618

00:39:01,500 --> 00:39:05,500

Confirmed and as Christine found out, dangerous.

619

00:39:05,500 --> 00:39:08,500

Don't try any of these experiments at home.

620

00:39:08,500 --> 00:39:12,500

Like Christine, you could end up burned.

621

00:39:19,500 --> 00:39:22,500

The static cannon myth seems to have short circuited.

622

00:39:22,500 --> 00:39:27,500

The mythbusters can't generate a fatal shock out of their PVC pipe.

623

00:39:27,500 --> 00:39:35,500

No matter how much sand they blasted with, they need to find a way to create a much bigger static charge.

624

00:39:35,500 --> 00:39:40,500

And Jamie and Adam have very different ideas about how to do it.

625

00:39:40,500 --> 00:39:45,500

You know, I didn't get any satisfaction out of the last thing with the static cannon.

626

00:39:45,500 --> 00:39:47,500

Now we're going to have some real fun.

627

00:39:47,500 --> 00:39:53,500

We're going to make a Van de Graaff generator and see whether we can make some big static electricity out of it.

628

00:39:54,500 --> 00:40:02,500

A Van de Graaff generator uses a spinning belt to carry a charge picked up from a brush at the bottom of a long tube to another brush at the top,

629

00:40:02,500 --> 00:40:06,500

where the charge is distributed onto a metal sphere.

630

00:40:06,500 --> 00:40:12,500

It's a simple machine, but can generate in excess of 100,000 volts.

631

00:40:12,500 --> 00:40:15,500

So on top of this is going to go an aluminum sphere.

632

00:40:15,500 --> 00:40:19,500

And basically all we have to do is put a belt in the middle of this.

633

00:40:19,500 --> 00:40:22,500

And that will probably be the hardest part, this belt we have to custom make.

634

00:40:23,500 --> 00:40:31,500

So the build team will try to create a Van de Graaff generator and a bigger kick than the static cannon.

635

00:40:31,500 --> 00:40:34,500

Scotty starts on the rollers for the belt.

636

00:40:34,500 --> 00:40:36,500

Oh, happy new year.

637

00:40:36,500 --> 00:40:39,500

The belt itself is Carrie's job.

638

00:40:39,500 --> 00:40:45,500

I'm trying to precisely cut this vinyl so that Jamie doesn't get mad at me.

639

00:40:45,500 --> 00:40:48,500

See whether they're actual.

640

00:40:48,500 --> 00:40:53,500

Incredibly, Jamie didn't have a huge metal globe lying around the workshop.

641

00:40:53,500 --> 00:40:55,500

They've had to order one in.

642

00:40:57,500 --> 00:41:01,500

The belt will be driven by a small electric motor.

643

00:41:01,500 --> 00:41:07,500

This is brass screen, which we're going to make into the electron sprayers.

644

00:41:07,500 --> 00:41:11,500

Those little fingers reach out and grab the electrons.

645

00:41:13,500 --> 00:41:17,500

They have all the components they need for the generator.

646

00:41:17,500 --> 00:41:19,500

And there you have it.

647

00:41:20,500 --> 00:41:24,500

Adam hasn't given up on that static cannon.

648

00:41:24,500 --> 00:41:29,500

He's got a hunch it just needs a helping hand to produce that fatal jolt.

649

00:41:29,500 --> 00:41:36,500

Well, we're back to our old Mythbuster tricks with our friendly early capacitor, the Leiden jar.

650

00:41:36,500 --> 00:41:41,500

This is a device for storing a charge.

651

00:41:41,500 --> 00:41:43,500

It actually acts like a capacitor.

652

00:41:43,500 --> 00:41:48,500

And it does that with a layer of foil on the outside and a layer of foil on the inside.

653

00:41:48,500 --> 00:41:50,500

And the charge is stored between them.

654

00:41:50,500 --> 00:41:55,500

Those two foil sheets are enough to store quite an impressive little charge.

655

00:41:55,500 --> 00:42:01,500

Okay, the meter is actually reading about 5,000 volts.

656

00:42:01,500 --> 00:42:04,500

5,000 volts. Not bad.

657

00:42:04,500 --> 00:42:08,500

But will a bigger Leiden jar store a bigger charge?

658

00:42:09,500 --> 00:42:11,500

That's 6,000.

659

00:42:12,500 --> 00:42:15,500

I'm building it up. That's 7,500.

660

00:42:20,500 --> 00:42:22,500

9,500.

661

00:42:22,500 --> 00:42:26,500

So bigger is better when it comes to storing static.

662

00:42:26,500 --> 00:42:30,500

And out on the workshop, there's a very big pipe indeed.

663

00:42:30,500 --> 00:42:32,500

Hello!

664

00:42:32,500 --> 00:42:36,500

Sandblasting our big PVC pipe didn't actually yield a very large charge.

665

00:42:36,500 --> 00:42:43,500

Mainly because we've been finding out through our research that PVC is actually quite poor at storing a high voltage charge.

666

00:42:43,500 --> 00:42:46,500

Part of the Myth says that he was cleaning paint off the pipe.

667

00:42:46,500 --> 00:42:49,500

And I know that metallic paint is actually somewhat conductive.

668

00:42:49,500 --> 00:42:57,500

So I'm going to paint the end of this pipe on the inside and outside with a chrome spray paint to see if I can create, in fact, a modified Leiden jar.

669

00:42:57,500 --> 00:43:02,500

Something that can actually store a charge and perhaps discharge it all at once out at the end.

670

00:43:02,500 --> 00:43:05,500

So the cannon is becoming a Leiden jar.

671

00:43:05,500 --> 00:43:09,500

One end sprayed inside and out with a metallic paint.

672

00:43:10,500 --> 00:43:19,500

The tape is a key part of the Leiden jar's construction in that the outer and the inner surfaces, the metallic surfaces can't actually be in contact with each other.

673

00:43:19,500 --> 00:43:24,500

Only when they're close but not in contact are they able to store a small charge between them.

674

00:43:25,500 --> 00:43:30,500

This could prove a stroke of genius, or maybe it's just desperation.

675

00:43:30,500 --> 00:43:35,500

When the paint dries, Adam's pipe will certainly look more like a cannon.

676

00:43:35,500 --> 00:43:40,500

But that will mean nothing if it doesn't pack a killer punch.

677

00:43:43,500 --> 00:43:47,500

Back in the land of Van Der Graaf, the generator is coming together.

678

00:43:48,500 --> 00:43:49,500

Things are going well.

679

00:43:50,500 --> 00:43:53,500

Here's a sentence you don't hear too often on a Mythbusters build.

680

00:43:54,500 --> 00:43:56,500

Well, that was a lot easier than I thought it'd be.

681

00:43:57,500 --> 00:43:59,500

It's actually kind of scary.

682

00:43:59,500 --> 00:44:03,500

I'm a little concerned as to whether we could actually hurt somebody with this.

683

00:44:03,500 --> 00:44:09,500

Because the only people that I know that have played around with these things have played around with little ones that you can put on a desktop.

684

00:44:09,500 --> 00:44:11,500

This is not a little one.

685

00:44:11,500 --> 00:44:13,500

Yeah, I have no idea what this is going to do.

686

00:44:13,500 --> 00:44:15,500

Let's find out. Go ahead and plug it in.

687

00:44:15,500 --> 00:44:17,500

Be ready to unplug it real quick.

688

00:44:17,500 --> 00:44:18,500

Okay.

689

00:44:23,500 --> 00:44:24,500

Gotcha.

690

00:44:24,500 --> 00:44:25,500

That hurt.

691

00:44:26,500 --> 00:44:30,500

If it's working, there should be a static field around the dome.

692

00:44:30,500 --> 00:44:32,500

You're the one with the hair.

693

00:44:32,500 --> 00:44:34,500

You're doing it.

694

00:44:36,500 --> 00:44:37,500

All right.

695

00:44:38,500 --> 00:44:40,500

Will this make my hair stand up?

696

00:44:40,500 --> 00:44:42,500

Oh, ow!

697

00:44:45,500 --> 00:44:47,500

That was that long!

698

00:44:47,500 --> 00:44:49,500

Oh my God!

699

00:44:49,500 --> 00:44:52,500

I'm fed enough of my day. I want to go home.

700

00:44:52,500 --> 00:44:56,500

And now for your entertainment, the oldest trick in the book.

701

00:44:56,500 --> 00:45:00,500

I'm checking out. It's not working. I don't know what's wrong with it.

702

00:45:00,500 --> 00:45:01,500

That's our band grab generator?

703

00:45:01,500 --> 00:45:02,500

Yeah.

704

00:45:03,500 --> 00:45:05,500

Why not work? Why not work?

705

00:45:05,500 --> 00:45:07,500

We haven't figured it out yet.

706

00:45:18,500 --> 00:45:20,500

I felt that spectacular.

707

00:45:20,500 --> 00:45:21,500

Little.

708

00:45:21,500 --> 00:45:22,500

It's a carpet spark.

709

00:45:22,500 --> 00:45:23,500

Yeah.

710

00:45:23,500 --> 00:45:26,500

So you've made a seven foot tall carpet.

711

00:45:28,500 --> 00:45:34,500

By adjusting the position of the brushes, they should be able to increase the charge being generated.

712

00:45:34,500 --> 00:45:36,500

Wait, don't play it until I'm holding onto it.

713

00:45:36,500 --> 00:45:40,500

Standing on a wooden box, Carrie is insulated from the ground.

714

00:45:40,500 --> 00:45:46,500

The charge is building up on her body, repeating that hair-raising old school science lab trick.

715

00:45:46,500 --> 00:45:47,500

Feel it.

716

00:45:47,500 --> 00:45:49,500

And your hair is standing up a little bit.

717

00:45:49,500 --> 00:45:51,500

Yeah. Here it goes.

718

00:45:52,500 --> 00:45:54,500

We're at 50,000 volts.

719

00:45:54,500 --> 00:46:01,500

Unexpectedly, it turns out that's a charge big enough to suck all the power out of Jamie's legs.

720

00:46:01,500 --> 00:46:02,500

Whoa!

721

00:46:03,500 --> 00:46:05,500

Jamie, you want it running to get a shot?

722

00:46:05,500 --> 00:46:06,500

Do it. Do it.

723

00:46:06,500 --> 00:46:07,500

Come on, baby.

724

00:46:07,500 --> 00:46:08,500

Touch it.

725

00:46:08,500 --> 00:46:10,500

Show those big c\*\*\*\*\*.

726

00:46:11,500 --> 00:46:13,500

Adam will give you mouth to mouth if you pass out.

727

00:46:15,500 --> 00:46:16,500

Scotty.

728

00:46:17,500 --> 00:46:19,500

Well, the machine's working, we can tell it's working.

729

00:46:22,500 --> 00:46:24,500

It's making all this horrible popping noise.

730

00:46:24,500 --> 00:46:26,500

What are you doing? Are you snake charming over there?

731

00:46:26,500 --> 00:46:28,500

You're teasing it. You're just going to make it mad.

732

00:46:29,500 --> 00:46:33,500

You've been doing some sort of grateful dead dancing by us for some reason.

733

00:46:33,500 --> 00:46:35,500

Come on, let's do it.

734

00:46:36,500 --> 00:46:37,500

I'm feeling it.

735

00:46:37,500 --> 00:46:39,500

My arm hairs are standing up out here.

736

00:46:39,500 --> 00:46:40,500

Come on, come on.

737

00:46:48,500 --> 00:46:50,500

Now it's time for Adam to step up.

738

00:46:50,500 --> 00:46:51,500

Oh, wow.

739

00:46:51,500 --> 00:46:55,500

God, I feel the power.

740

00:46:57,500 --> 00:46:59,500

Stop sparking my...

741

00:47:01,500 --> 00:47:04,500

This is doing nothing for the myth's credibility.

742

00:47:05,500 --> 00:47:06,500

Wow!

743

00:47:06,500 --> 00:47:13,500

Even with that big charge, the current is so small and the pulse so short that no one is getting hurt.

744

00:47:13,500 --> 00:47:16,500

It's the full God-giving knowledge to Adam.

745

00:47:18,500 --> 00:47:24,500

Well, Jamie, according to our instruments, I've got a couple of hundred thousand volts heading through my body,

746

00:47:24,500 --> 00:47:32,500

and even with this amount, it still...it hurts, but it's not killing us and it doesn't sound like a thunder clap.

747

00:47:32,500 --> 00:47:34,500

That's true. Can I go away now?

748

00:47:34,500 --> 00:47:35,500

You can go away now.

749

00:47:37,500 --> 00:47:43,500

No one's going anywhere until they finally lay this myth or Adam to rest.

750

00:47:43,500 --> 00:47:49,500

Has he created a deadly weapon with his static cannon come lighting jar?

751

00:47:54,500 --> 00:47:59,500

Despite the metallic paint, the charge just isn't building up.

752

00:47:59,500 --> 00:48:03,500

This is really sluggish. It doesn't really seem to want to go above 4,000 volts.

753

00:48:03,500 --> 00:48:05,500

All right, Jamie!

754

00:48:07,500 --> 00:48:10,500

And the discharge isn't hair-raising either.

755

00:48:10,500 --> 00:48:11,500

20 milliamps.

756

00:48:11,500 --> 00:48:12,500

Yeah, they're a good drop.

757

00:48:12,500 --> 00:48:16,500

They're both just dropped from 4,000 to zero and we had a 20 milliamp jump.

758

00:48:18,500 --> 00:48:22,500

That's totally not nearly enough to hurt anybody.

759

00:48:23,500 --> 00:48:28,500

It seems PVC pipe just isn't very good at storing a big charge.

760

00:48:28,500 --> 00:48:30,500

And there's another problem.

761

00:48:30,500 --> 00:48:35,500

Like humidity, dust in the air can help dissipate a static charge.

762

00:48:35,500 --> 00:48:40,500

So the sandblasting in the myth could well have doomed it from the start.

763

00:48:41,500 --> 00:48:46,500

Well, Jamie, Christine was recording the entire time and although the paint actually acted like a laden jar

764

00:48:46,500 --> 00:48:50,500

and it did store a small charge, that charge never got above 6,000 volts.

765

00:48:50,500 --> 00:48:55,500

And then when you did a discharge and the amperage dump was like 20 milliamps.

766

00:48:55,500 --> 00:48:59,500

I mean, it's not nearly enough to cause you any real damage through your skin.

767

00:48:59,500 --> 00:49:02,500

I think this myth is totally busted.

768

00:49:02,500 --> 00:49:03,500

Yeah.

769

00:49:20,500 --> 00:49:25,500

Thanks for watching.