1

00:00:00,000 --> 00:00:05,320

What you're about to see could be downright dangerous. So a word of advice leave the myth busting to us

2

00:00:07,320 --> 00:00:09,320

On this episode of myth busters

3

00:00:10,080 --> 00:00:13,980

With good reason we spent ten years telling you to not try this at home

4

00:00:14,140 --> 00:00:19,000

But in this episode we've compiled a bunch of things that we think you might be able to try at home

5

00:00:20,120 --> 00:00:22,120

Like this

6

00:00:22,120 --> 00:00:33,780

Well not exactly like that, but after 200 episodes of saying don't try this at home

7

00:00:34,280 --> 00:00:37,620

The myth busters are apparently changing their tune

8

00:00:38,840 --> 00:00:41,920

To deliver a DIY science special

9

00:00:42,680 --> 00:00:46,320

Your results may vary so prepare your safety glasses

10

00:00:47,640 --> 00:00:49,640

your pocket protectors

11

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

And your clipboard

12

00:00:53,720 --> 00:01:00,560

Because for this episode they're finding myths you can maybe try at home or maybe not

13

00:01:05,080 --> 00:01:07,080

Who are the myth busters?

14

00:01:08,040 --> 00:01:10,040

Adam Savage

15

00:01:10,760 --> 00:01:12,760

And Jamie Heineman

16

00:01:14,200 --> 00:01:18,160

Between them more than 30 years of special effects experience

17

00:01:19,120 --> 00:01:21,120

Together with Carrie Byron

18

00:01:22,360 --> 00:01:24,360

Tori Balachy

19

00:01:25,360 --> 00:01:27,360

And grant him a horror

20

00:01:29,000 --> 00:01:33,760

They don't just tell the myths they put them to the test

21

00:01:33,760 --> 00:01:35,760

Okay

22

00:01:46,560 --> 00:01:54,520

So the do try this at home special exactly our lawyers are actually okay with this they are but here's the thrust of this episode

23

00:01:54,520 --> 00:01:56,520

We are gonna be testing a bunch of zany

24

00:01:56,760 --> 00:02:03,960

Experiments and viral videos and assessing one whether or not they're true, but two whether or not they're actually okay to try at home

25

00:02:03,960 --> 00:02:07,680

So some of this may be actually too dangerous to try yes

26

00:02:07,680 --> 00:02:11,480

The first one though, I think is gonna be pretty easy to try at home, and it's a classic

27

00:02:12,120 --> 00:02:17,120

Microwaved water. Yeah, micro waved water will kill plants if you water them with it

28

00:02:17,120 --> 00:02:19,520

I don't think it's true at all, and I think we should test it

29

00:02:20,400 --> 00:02:22,880

It's an internet myth that has spread worldwide

30

00:02:23,720 --> 00:02:29,640

Supposedly these pictures are evidence that water boiled in a microwave is toxic to plants

31

00:02:29,880 --> 00:02:33,360

But could that be true or is this myth in hot water?

32

00:02:34,400 --> 00:02:38,080

Well, if it turns out you can try this at home, you'll need the following

33

00:02:39,440 --> 00:02:44,840

And down in the shop Adam's green thumb is prepping his test of the waters

34

00:02:45,080 --> 00:02:49,040

So the question we're gonna answer is does microwave boiled water kill plants?

35

00:02:49,400 --> 00:02:56,560

Very nice to determine that we're going to expose some plants to microwave boiled water, of course beautiful

36

00:02:56,720 --> 00:03:01,120

We're also gonna compare that to some other controls one will be water boiled on the stove

37

00:03:01,160 --> 00:03:09,640

One will be just regular tap water one will be no water at all and now for the supposedly toxic ingredient the microwave boiled water

38

00:03:10,600 --> 00:03:14,880

Obviously to conduct this experiment you're gonna need a bunch of water that's been boiled in a microwave

39

00:03:15,280 --> 00:03:18,200

Bombarded by those evil microwaves put it in

40

00:03:19,040 --> 00:03:23,640

Push the button start there we go run it for five minutes a full power seat that works

41

00:03:25,080 --> 00:03:28,400

There we go. All right now as a point of clarity

42

00:03:28,400 --> 00:03:33,480

I want to point out the myth isn't that plants don't like boiling water for gosh sakes

43

00:03:33,480 --> 00:03:38,680

Don't pour boiling water on your plants. You'll kill them immediately like most other living things now

44

00:03:38,720 --> 00:03:41,320

Let this water cool down to room temperature

45

00:03:42,120 --> 00:03:44,600

Before using it on a living thing

46

00:03:44,800 --> 00:03:50,320

Well with his three types of H2O inside the rig he's ready to get his thumbs green

47

00:03:51,080 --> 00:03:52,480

There we go

48

00:03:52,480 --> 00:03:58,160

We've used eight romaine lettuce in four groups and we're subjecting those four groups to four

49

00:03:58,520 --> 00:04:04,760

distinctly different conditions of water now that water is coming from these buckets up here through these water timers and they're all

50

00:04:04,760 --> 00:04:10,200

Set to water the plants for exactly the same amount of time and exactly the same amount of water every single day

51

00:04:10,200 --> 00:04:13,480

But wait you say what about sunlight? Ah, we thought of that

52

00:04:14,800 --> 00:04:16,920

That's the light these are actual grow lights

53

00:04:16,920 --> 00:04:21,240

We're gonna subject our plants to these grow lights for about 16 hours a day a really nice

54

00:04:21,760 --> 00:04:27,840

Vibrant sunlight and we'll log their growth on this chart here after a week. I swear we should see a difference after a couple of weeks

55

00:04:27,840 --> 00:04:29,840

I think this test is gonna be pretty definitive

56

00:04:30,680 --> 00:04:36,880

But as exciting as it is to watch lettuce grow, let's fast forward one week into the future

57

00:04:38,640 --> 00:04:41,200

All right, let's see how everyone's been doing

58

00:04:42,200 --> 00:04:44,200

Look at that

59

00:04:45,760 --> 00:04:47,760

9.25

60

00:04:48,280 --> 00:04:56,520

Boiled water is outgrowing everything else. It was around five and a half inches and now it's over nine inches tall right now

61

00:04:56,520 --> 00:04:58,520

It's not looking very good for some math

62

00:04:59,360 --> 00:05:04,400

So after two weeks of growth Adam is let loose amongst the lettuce for the last time

63

00:05:04,840 --> 00:05:11,020

What we wanted to determine was whether microwave water was dangerous and I think definitively we proved that it's not look at this

64

00:05:11,380 --> 00:05:17,520

This is the healthiest plant in here both of these they're higher than any of the others and they got the microwave boiled water

65

00:05:17,760 --> 00:05:23,460

They're totally fine. Oh, and we also determined that no water is really really crappy for plants

66

00:05:23,460 --> 00:05:31,000

So note that you brown thumbs it may be busted, but don't take our word for it. Try this at home

67

00:05:31,720 --> 00:05:33,720

You

68

00:05:37,920 --> 00:05:40,480

Next up some emergency firefighting

69

00:05:42,760 --> 00:05:48,460

All right, so first step is a viral video the fans want to know if it's possible and if they can try it at home check it out

70

00:05:49,560 --> 00:05:55,260

With a runabout ablaze it's jet boat to the rescue fighting fire with speed

71

00:05:55,780 --> 00:05:57,780

Oh

72

00:05:59,340 --> 00:06:04,620

But in a crisis could an extreme 180 really extinguish a fire

73

00:06:05,980 --> 00:06:10,500

Dude that is awesome, but you know there's something a little fishy about that video

74

00:06:10,860 --> 00:06:14,340

It does look like there could be some kind of visual effects going on there

75

00:06:14,340 --> 00:06:18,320

We need to find out if this thing is repeatable. Yay. Let's go boating

76

00:06:18,940 --> 00:06:21,140

Motorboating you'll see you

77

00:06:21,540 --> 00:06:29,820

So to find out if this works over at big break marina they're recreating all the elements of this emergency situation

78

00:06:31,100 --> 00:06:36,100

So the boat we're gonna be using to put out the fire is this it's a 1978 charger jet boat

79

00:06:36,100 --> 00:06:42,900

It's got a 350 Osmobile engine come aboard matey. All right safety first my friend safety first

80

00:06:43,100 --> 00:06:47,500

Not only that but it shoots a rooster tail up to 120 feet

81

00:06:47,500 --> 00:06:51,620

We should be able to put out the fire with this. I wish we had dork your life preservers

82

00:06:51,980 --> 00:06:56,540

Sorry, man. These are the dorkiest ones we could possibly find. What are you talking about?

83

00:06:56,540 --> 00:06:59,700

They match the boat there in this season's color of safety

84

00:07:01,860 --> 00:07:04,060

And the best part is they're letting me drive

85

00:07:04,580 --> 00:07:07,780

Except the owner has one stipulation he wants to be on the boat with us

86

00:07:07,780 --> 00:07:12,740

Which doesn't make any sense because this is probably the most dangerous place you can be I think we need to practice

87

00:07:13,540 --> 00:07:15,540

Driving

88

00:07:17,180 --> 00:07:22,180

Precision driving is key to this myth so first Tori needs to get the boat up to speed

89

00:07:22,900 --> 00:07:27,540

Then just before he crashes into the pylon pull off that 180 turn

90

00:07:30,020 --> 00:07:33,180

So that the boat sends up that dousing rooster tail

91

00:07:36,740 --> 00:07:40,500

That was amazing practice, but I think it's time to light a fire

92

00:07:41,140 --> 00:07:43,140

Yeah, I think you got it man

93

00:07:43,500 --> 00:07:50,900

The second element of this emergency is the flaming boat and for that they're taking precautions. Oh, hey

94

00:07:51,260 --> 00:07:55,220

So this fine watercraft is our fire boat

95

00:07:55,260 --> 00:08:00,440

We're going to set a bale of hay and a pallet on fire and let it burn

96

00:08:00,580 --> 00:08:04,780

You got the air underneath so that it can light all those hay and actually get a good burn

97

00:08:04,780 --> 00:08:07,540

This thing should flame up nicely now if things go well

98

00:08:07,780 --> 00:08:14,320

We'll be able to put it out using the boat and if not the fire department is on hand to put it out

99

00:08:14,740 --> 00:08:16,220

Time to set the fire

100

00:08:16,220 --> 00:08:22,320

But before we do that we're going to wet down all of the lands right behind where the boat's gonna be

101

00:08:22,320 --> 00:08:25,820

We don't want any stray embers to cause any unnecessary fire

102

00:08:26,500 --> 00:08:29,160

The boat is now set to go up just like the video

103

00:08:29,700 --> 00:08:35,460

Great some vacation carry, but will the speed boats rooster tail quench the blaze

104

00:08:36,100 --> 00:08:38,100

All right boats tide

105

00:08:38,660 --> 00:08:41,860

Tori's all ready to go. We got to do set the fire now

106

00:08:42,420 --> 00:08:48,080

Yeah, let's do this. No, I'm not gonna lie. I am a little nervous. I mean this isn't my boat

107

00:08:48,300 --> 00:08:50,500

All right proceed with lighting the fire

108

00:08:50,780 --> 00:08:54,820

We're gonna be flying at 50 miles an hour straight towards a flaming boat

109

00:08:54,820 --> 00:09:00,940

And at the last minute I need to crank on the wheel so that I don't crash into the boat, but spray water onto it

110

00:09:00,940 --> 00:09:04,780

All right boys. We have a raging fire bring it on in and no no that

111

00:09:04,780 --> 00:09:09,340

I'm gonna have Grant and the owner of the boat in the boat with me. So if I crash, I'm not just hurting myself

112

00:09:09,340 --> 00:09:11,820

I'm hurting two other people. I'm scared

113

00:09:16,260 --> 00:09:21,300

Just so I understand what we're doing we're heading straight towards a flaming boat, right exactly

114

00:09:21,300 --> 00:09:25,740

Okay, and then the last minute we're gonna turn out. I hope this works

115

00:09:35,780 --> 00:09:42,340

After 10 years of impossible dangerous and downright crazy myths that you shouldn't

116

00:09:43,780 --> 00:09:45,780

Or couldn't try at home

117

00:09:46,900 --> 00:09:51,100

This episode is all about finding things maybe you can

118

00:09:52,220 --> 00:09:56,860

So next Adam and Jamie get into a rhythm with one two five

119

00:09:58,340 --> 00:10:00,340

216 metronomes

120

00:10:05,580 --> 00:10:09,080

Well that escalated quickly, but how did they end up here?

121

00:10:14,820 --> 00:10:21,180

There are a bunch of videos out there that show these things getting into sync if you let them run for a while

122

00:10:21,660 --> 00:10:23,660

Come on guys get with it

123

00:10:24,860 --> 00:10:26,860

It all looks so easy online

124

00:10:27,140 --> 00:10:34,060

Although they start out syncopated these metronomes eventually tick over into a synchronized symphony

125

00:10:35,780 --> 00:10:40,020

But can you make metronomes dance to the same beat at home?

126

00:10:41,220 --> 00:10:47,060

There is one thing that I keep noticing in all the videos of the metronome syncing up and it is that they always seem to be

127

00:10:47,060 --> 00:10:53,380

Sitting on a platform that moves slightly that's got a little shake or shimmy to it. Let me show you why I think that's important

128

00:10:55,020 --> 00:10:57,260

If I move this metronome while it's ticking

129

00:10:57,540 --> 00:11:05,700

Even small movements have a significant effect on the periodicity of its ticking

130

00:11:06,260 --> 00:11:10,300

I've got a couple of soda cans. This is my platform with shimmy

131

00:11:10,380 --> 00:11:13,620

Got a metronome, and I just want to see what happens when I put one on here

132

00:11:16,380 --> 00:11:18,380

You see it

133

00:11:19,580 --> 00:11:21,580

It's totally moving

134

00:11:21,580 --> 00:11:22,740

This is very cool

135

00:11:22,740 --> 00:11:26,460

This little metronome is definitely having an appreciable effect on my platform

136

00:11:26,460 --> 00:11:31,540

And I think it'll have even more of an effect if the platforms lighter, and I've got just the thing

137

00:11:32,220 --> 00:11:33,740

All right, this is working great

138

00:11:33,740 --> 00:11:40,220

It's definitely having more of an appreciable effect because I got a nice bearing surface platform light aluminum pipes and a very light platform

139

00:11:40,220 --> 00:11:47,100

For it to sit on I'm taking away as much friction and momentum as I can so that only the metronome is having the effect now

140

00:11:47,100 --> 00:11:48,340

Let's try to

141

00:11:48,380 --> 00:11:55,140

Adam doubles his trouble with two metronomes set to the same tick mark look at the movement on this platform

142

00:11:55,900 --> 00:11:59,100

And after two minutes the shimmy takes over

143

00:12:00,500 --> 00:12:02,500

Stay with it boys

144

00:12:04,140 --> 00:12:06,980

It just took them a little while to find each other's rhythm

145

00:12:08,020 --> 00:12:14,300

So if two will sink will five march to the beat this pink one is messing with my

146

00:12:14,900 --> 00:12:22,060

Mellow here well three minutes in and something has come unsung this pink one is way out of phase with the other four

147

00:12:22,060 --> 00:12:27,340

The other four seem to want to get into phase with each other, but the pink one's not playing along nicely

148

00:12:27,940 --> 00:12:30,300

Why can't you get along like your brothers?

149

00:12:30,940 --> 00:12:32,940

All right, here we go. Let's try

150

00:12:36,620 --> 00:12:42,580

Amazingly it seems that Adam has tickled the pink just the right amount there it is okay

151

00:12:44,620 --> 00:12:46,620

We got to work it

152

00:12:50,860 --> 00:12:54,180

Yep, they're in sync that's awesome, okay

153

00:12:55,340 --> 00:12:57,700

Everyone be quiet everyone be quiet stop stop stop

154

00:12:58,260 --> 00:13:00,220

All right, let me explain what happened here

155

00:13:00,220 --> 00:13:06,260

This pink one was not playing well with the others and I noticed when I was watching it that it was just

156

00:13:06,580 --> 00:13:13,360

Consistently a little too slow so in the theory that the manufacturing tolerances on these metronomes are loose I

157

00:13:14,280 --> 00:13:19,160

Sped it up by dropping it a tiny amount below its lowest tick mark

158

00:13:19,160 --> 00:13:25,400

Which is what all the others are set at and that turned out to be the magic bullet that helped this all get in sync

159

00:13:25,560 --> 00:13:27,840

That's awesome to know these are tunable

160

00:13:28,840 --> 00:13:34,400

And now that he's got his tickers tweaked just how many can he make dance to his tune?

161

00:13:35,240 --> 00:13:38,160

Got it. I can't fit any more on here

162

00:13:38,880 --> 00:13:40,880

I

163

00:13:42,480 --> 00:13:44,480

Love it

164

00:13:46,400 --> 00:13:48,400

It's really kind of amazing

165

00:13:49,520 --> 00:13:56,560

They they go way out of sync and they come back in this thing and eventually they find this and if one of them's out

166

00:13:59,560 --> 00:14:05,240

They kind of get him back in line they all just want to be friends they all want to be friends they all want to do the same thing

167

00:14:06,240 --> 00:14:12,320

Adam's taken this to 11. I sense a serious escalation about to start

168

00:14:18,880 --> 00:14:22,560

Down at big break Marina all you got a good rage and fire

169

00:14:25,760 --> 00:14:27,760

Tori is zooming full speed ahead

170

00:14:30,680 --> 00:14:33,360

To test an emergency fire fighting trick

171

00:14:35,880 --> 00:14:37,880

Oh

172

00:14:40,720 --> 00:14:44,120

Tori's rooster tail certainly seems to have doused the boat

173

00:14:44,440 --> 00:14:48,200

But there's no smoke without fire so the guys reset

174

00:14:48,680 --> 00:14:53,720

Reset so we can do it again with one more pass just to make sure it's out. I think it's looking good though

175

00:14:54,640 --> 00:14:58,400

Skipper Bellachy takes another turn at fighting fire with speed

176

00:15:05,360 --> 00:15:07,360

Thank you

177

00:15:10,120 --> 00:15:11,720

There's no way that's on fire

178

00:15:11,720 --> 00:15:14,720

I think it went out with the first pass the second passes insurance

179

00:15:14,720 --> 00:15:20,520

I think the third time just for fun clearly you can extinguish a fire with an emergency U-turn

180

00:15:29,440 --> 00:15:35,120

But now that they know this fire fighting feat is no myth the question is should you?

181

00:15:35,280 --> 00:15:41,600

Try this at home that was crazy going at full throttle 50 miles an hour straight towards a flaming boat

182

00:15:43,200 --> 00:15:49,460

And then right before I hit it I had to crank the wheel to spray the water onto the flaming boat

183

00:15:54,840 --> 00:15:59,880

I totally can't believe it worked, but you know what I don't think I'd try this at home

184

00:16:00,200 --> 00:16:08,680

Yes, we were able to pull this off despite not being professional firefighters despite not being professional boat drivers

185

00:16:10,200 --> 00:16:13,820

But here's the thing in order to do this you need to

186

00:16:14,200 --> 00:16:21,560

Overcome your fear of driving directly at a flaming boat and be able to turn at the last second not to mention

187

00:16:22,080 --> 00:16:24,080

You need a jet boat

188

00:16:24,480 --> 00:16:28,680

Unfortunately, this is not something that just anybody can do yep

189

00:16:28,680 --> 00:16:35,060

It's always best to leave the firefighting to the professionals owner of just will let me borrow his boat again

190

00:16:35,760 --> 00:16:37,760

anytime

191

00:16:42,400 --> 00:16:46,640

Well the myth that metronomes have placed on a proper surface and activated together will eventually

192

00:16:46,960 --> 00:16:52,880

Sync themselves up seems to be on pretty solid footing got it to work with a couple got it to work with a handful

193

00:16:52,920 --> 00:16:55,120

But now it's time to go for broke

194

00:16:58,680 --> 00:17:03,380

In front of me here is an air hockey table and Jamie has set out carefully

195

00:17:04,440 --> 00:17:10,680

216 metronomes this is more than we have ever seen in any of the videos demonstrating this phenomenon in a few minutes

196

00:17:10,680 --> 00:17:14,080

We are hoping that we'll be setting an unofficial world's record

197

00:17:14,800 --> 00:17:19,600

Why are we using an air hockey table air hockey is a game in which the puck floats on a cushion of air?

198

00:17:20,280 --> 00:17:24,920

It's definitely floating and now our metronomes will float on a cushion of air

199

00:17:24,920 --> 00:17:30,320

That should allow them the low friction environment that makes them shimmy their way to synchronization

200

00:17:31,240 --> 00:17:33,240

So how do you want to do this?

201

00:17:33,440 --> 00:17:38,840

I'll start at this corner. Why don't you start at that corner and we'll just go for it. All right.
You want to count it in?

202

00:17:39,360 --> 00:17:42,380

All right, three two one go

203

00:17:45,080 --> 00:17:49,120

It's a painstaking task to start all the metronomes one by one

204

00:17:49,560 --> 00:17:55,760

Done with my half, but now that they're ticking at the same tempo in theory. They should start that shimmy

205

00:17:56,440 --> 00:17:58,440

Now they're all going

206

00:17:59,200 --> 00:18:02,240

They're all going and they're floating on the cushion of air

207

00:18:03,520 --> 00:18:06,440

I really have totally hypnotized by the sound. I know

208

00:18:07,000 --> 00:18:12,400

But with 216 metronomes almost 20 times the amount of their last attempt

209

00:18:13,640 --> 00:18:18,800

Can they break a world record or will the metronomes march to a different tune?

210

00:18:19,880 --> 00:18:33,880

It's the do try this at home special and next up Adam and Jamie are investigating the old ball chain

211

00:18:34,600 --> 00:18:41,240

We all know what this stuff is regular chrome ball chain keys IDs and dog tags have been hanging from it for decades

212

00:18:41,240 --> 00:18:45,960

But we've got a viral video that seems to show this stuff under the right conditions

213

00:18:46,440 --> 00:18:48,120

behaving almost

214

00:18:48,160 --> 00:18:50,160

Against the force of gravity

215

00:18:51,040 --> 00:18:56,680

So supposedly this gravity defying feat is achieved without any special effects wizardry

216

00:18:56,800 --> 00:19:00,600

But are they yanking your chain or could you really?

217

00:19:01,120 --> 00:19:07,160

Recreate it with just a ball chain a beaker and if you have one a high-speed camera check this out

218

00:19:15,760 --> 00:19:17,760

Let's check out the high speed

219

00:19:18,240 --> 00:19:19,740

Hey, Adam

220

00:19:19,740 --> 00:19:23,600

It's like oh, it's like it's going all the way across the room Wow

221

00:19:25,040 --> 00:19:28,280

It doesn't look like it should be able to do that doesn't it now

222

00:19:29,240 --> 00:19:33,280

It's like magic that is freaking gorgeous

223

00:19:34,480 --> 00:19:36,480

That is so freaking cool

224

00:19:36,840 --> 00:19:38,240

cool and

225

00:19:38,240 --> 00:19:44,280

Surprising as the ball chain seems to levitate out and over the lip of the cup and this strange behavior

226

00:19:44,640 --> 00:19:46,640

It's gotten Jamie thinking

227

00:19:47,480 --> 00:19:50,360

Now we've got some bigger chain. Let's see if it goes further

228

00:20:01,280 --> 00:20:04,680

It does seem the bigger the ball the greater the effect

229

00:20:04,840 --> 00:20:09,720

But is this gravity defying act also related to the distance you are from the ground?

230

00:20:10,080 --> 00:20:12,640

Okay, let's see what this does from eight feet up

231

00:20:17,520 --> 00:20:19,520

That

232

00:20:21,280 --> 00:20:23,080

Made a difference

233

00:20:23,080 --> 00:20:26,860

It's clear from our testing that there are two key forces that are causing this effect

234

00:20:26,880 --> 00:20:32,120

And the first is that mass moving in a particular direction wants to continue moving in that direction

235

00:20:32,160 --> 00:20:37,200

So when we're yanking the chain up out of the pot it wants to continue moving upward

236

00:20:37,240 --> 00:20:45,280

but shortly after gravity starts to pull it down and so that's where we get this arc if one of these forces is out of

237

00:20:45,400 --> 00:20:51,240

Balance like as in if gravity starts to pull down too hard and we don't get as large in an arc

238

00:20:51,280 --> 00:20:55,040

But when these two forces are perfectly balanced coupled with the unique

239

00:20:55,600 --> 00:21:01,640

Symmetrical and slick design of this chain it all converges to create an arc that seems like it should be impossible

240

00:21:02,440 --> 00:21:05,520

But whatever the explanation, it's a really cool effect

241

00:21:08,120 --> 00:21:12,720

It's cool and to take it to the max Adams got this one all chained up

242

00:21:13,240 --> 00:21:20,320

Wow the biggest ball chain I could possibly buy whenever you ready here we go

243

00:21:26,240 --> 00:21:29,000

That was amazing that worked really well

244

00:21:29,520 --> 00:21:36,160

It's almost magical watching the chain flow seemingly defying gravity out of the cup

245

00:21:36,160 --> 00:21:40,800

My favorite part about it though is that it seems to be proportional to the size of the ball chain

246

00:21:40,800 --> 00:21:45,600

So you get a little loop with stuff like this and you get a nice giant loop with stuff like this

247

00:21:45,600 --> 00:21:49,680

I didn't even know they made stuff this big until this story. This is awesome

248

00:21:50,880 --> 00:21:54,480

Yep, this chain reaction is surprisingly DIY

249

00:22:00,840 --> 00:22:06,640

So break out the beakers and the ball chain and make sure that you do try this at home

250

00:22:11,760 --> 00:22:14,780

Next the team is on a chemistry safari

251

00:22:15,280 --> 00:22:21,560

All right these next chemical experiments fans want us to test one if they're genuine and two if it's something that they could try at home

252

00:22:21,560 --> 00:22:24,720

What are they elephant toothpaste and exploding snakes?

253

00:22:25,320 --> 00:22:29,080

Elephants and exploding things. Are we sure that this is something that people can do at home?

254

00:22:29,640 --> 00:22:32,840

Well with an ingredients list made up of household items

255

00:22:33,440 --> 00:22:40,720

Elephant toothpaste is the force DIY science to try all you needs a little hydrogen peroxide the kind you would

256

00:22:40,800 --> 00:22:43,360

Get for dyeing your hair liquid dish soap

257

00:22:44,200 --> 00:22:46,200

little food coloring for a pizzazz

258

00:22:47,400 --> 00:22:48,760

and

259

00:22:48,760 --> 00:22:53,960

Finally the catalyst which is plain old yeast. Are you about to blow her mind? I am

260

00:22:54,480 --> 00:22:56,480

stand back

261

00:22:59,400 --> 00:23:03,160

It's like a volcano from science fair look at that it's minty fresh

262

00:23:03,520 --> 00:23:08,280

It's easy to see why this super-sized foam is called elephant toothpaste

263

00:23:08,560 --> 00:23:11,560

Now in its basic form hydrogen peroxide is extremely stable

264

00:23:11,560 --> 00:23:15,080

But what's happening here is when you add the yeast it's

265

00:23:15,520 --> 00:23:22,520

Decomposing the hydrogen peroxide very rapidly and releasing oxygen the oxygen is getting captured inside the liquid dish soap

266

00:23:22,520 --> 00:23:29,160

Which is creating bubbles in this big foamy awesome mess and although it passes the try this at home test

267

00:23:29,360 --> 00:23:35,040

It's just a frothy fountain. So how about an only on myth busters twist

268

00:23:35,520 --> 00:23:37,520

Don't try this at home

269

00:23:38,720 --> 00:23:44,240

All right to take this experiment from go ahead try it at home to myth busters danger

270

00:23:44,240 --> 00:23:50,360

We're gonna use some lab grade components here. We have a higher concentration of hydrogen peroxide and for our catalyst

271

00:23:51,040 --> 00:23:52,880

potassium iodide now

272

00:23:52,880 --> 00:23:58,800

These are much more caustic chemicals here and the reaction is a lot more energetic

273

00:24:00,320 --> 00:24:06,120

Okay, so take two but this is definitely do not try at home

274

00:24:06,600 --> 00:24:12,440

One step back is it gonna get crazy? Yeah, you better drop some science on us. You ready? Yeah do it

275

00:24:20,280 --> 00:24:26,160

Much more energetic experiments look how hot it is. Yeah, the steam coming off. Yep

276

00:24:26,160 --> 00:24:29,400

That's the kind of toothpaste an elephant would be proud of

277

00:24:29,840 --> 00:24:36,920

But now we've seen the toothpaste didn't someone mention an exploding snake

278

00:24:36,920 --> 00:24:40,920

Now for the most part elephant toothpaste is a sort of experiment you can do at home

279

00:24:40,920 --> 00:24:45,440

This next one is a little bit different. It's called explosive snake

280

00:24:46,600 --> 00:24:50,680

Now the first part of it involves sugar which by itself is innocuous

281

00:24:50,880 --> 00:24:55,080

The part that makes it different is the other half which is this

282

00:24:56,280 --> 00:24:58,280

sulfuric acid

283

00:25:00,000 --> 00:25:07,000

Sepheric acid is corrosive. It's caustic and if you splash on your skin you could get severe burns so

284

00:25:07,760 --> 00:25:12,720

Unfortunately, not the sort of thing you want to try at home and to do this experiment

285

00:25:12,720 --> 00:25:15,360

I think I'm gonna need a slightly different wardrobe

286

00:25:21,200 --> 00:25:28,440

Ah, that's better so I've got an apron to protect my clothing acid gloves to protect my hands and a face shield

287

00:25:29,400 --> 00:25:32,920

For my face now it's time to mix up the elements

288

00:25:34,040 --> 00:25:38,440

It's another do not try this at home, but will it be explosive?

289

00:25:41,720 --> 00:25:43,720

It's coming

290

00:25:44,280 --> 00:25:46,280

Actually, no

291

00:25:48,200 --> 00:25:53,560

Okay, so what happened here? Well the acid interacts with the sugar and breaks it down into its components

292

00:25:53,840 --> 00:25:59,320

Releases water in the form of steam and leaves behind carbon, which is what the snake is

293

00:25:59,560 --> 00:26:03,920

Now it's a very cool reaction, but not necessarily all that explosive

294

00:26:03,920 --> 00:26:08,600

I think in order to be explosive it should be faster and more violent

295

00:26:08,600 --> 00:26:12,880

And I think I can find a reaction that does that so lab raider

296

00:26:13,240 --> 00:26:19,400

Imahara swaps out the sugar for a classified organic compound adds the sulfuric acid

297

00:26:19,680 --> 00:26:25,240

Then brings a little heat to the equation, but will this result in that explosive snake?

298

00:26:28,440 --> 00:26:34,440

Hey, don't play this is gonna happen really fast. Okay, this is it

299

00:26:38,760 --> 00:26:43,360

That's amazing it's an instantaneous process called deamadization

300

00:26:43,360 --> 00:26:52,720

This sulfuric acid dehydrated the compound leaving in its wake a flaky carbon snake

301

00:26:54,160 --> 00:26:57,680

So conclusion two explosive snakes by different means

302

00:26:58,240 --> 00:27:03,040

But unfortunately because of the sulfuric acid you can't try either of them at home

303

00:27:03,760 --> 00:27:09,760

So while both myths are confirmed unless you've got access to a lab tech and lab grade materials

304

00:27:10,960 --> 00:27:12,960

You can't try these at home

305

00:27:14,080 --> 00:27:20,160

Meanwhile back at metronome HQ

306

00:27:24,000 --> 00:27:26,640

Every now and then it sounds like they're getting together. Yeah

307

00:27:27,840 --> 00:27:34,480

I do think that they cross phases somehow, but I think they may be in sequence, but not in the correct position

308

00:27:34,720 --> 00:27:37,920

If you look down the line, there's no rhythm or reason to that

309

00:27:38,640 --> 00:27:41,600

It's a case of so far not so good

310

00:27:44,000 --> 00:27:53,280

What you're about to see could be dangerous we're trained professionals, so please leave the myth busting to us

311

00:27:57,760 --> 00:28:00,880

Next could this soda stunt do you harm?

312

00:28:01,920 --> 00:28:07,600

Next up is a story that should definitely never be tried at home or anywhere else for that matter given that it's illegal in a

313

00:28:07,600 --> 00:28:10,400

Bunch of states. What's that dry ice bombs?

314

00:28:11,040 --> 00:28:14,000

Yep. Well exploding things is never a good idea to try

315

00:28:14,320 --> 00:28:16,640

So why is it we're tackling it on this show?

316

00:28:17,040 --> 00:28:22,080

Because like it or not people do try this at home. These things put out a tremendous bang

317

00:28:22,160 --> 00:28:24,960

I think they also put out a tremendous bite. That's what we want to look at

318

00:28:25,200 --> 00:28:32,160

So we want to find out just how dangerous they really are exactly we're gonna look precisely at why you should not try dry ice bombs at home

319

00:28:33,200 --> 00:28:36,720

This diy device works on that old trapped pressure principle

320

00:28:38,000 --> 00:28:41,040

Which the myth busters know can be both spectacular

321

00:28:41,600 --> 00:28:43,600

and lethal

322

00:28:43,600 --> 00:28:47,360

But just how lethal will these dry ice bombs turn out to be?

323

00:28:50,400 --> 00:28:53,200

To find out adam's got to set his cap first

324

00:28:54,080 --> 00:28:59,280

The capping it and getting away is where the real danger is i've seen these things go off as quickly as a few seconds

325

00:28:59,520 --> 00:29:05,280

So I don't want to be anywhere near these things when we're trying to film them on high speed camera and assess their damage

326

00:29:07,840 --> 00:29:12,480

That might work now we're going to be conducting this test with bottles as different as this one and this one

327

00:29:12,480 --> 00:29:16,640

But I need to put the caps on all of them and my method is going to be using this thing

328

00:29:17,360 --> 00:29:19,920

Because it has a handy turning part out the front

329

00:29:29,520 --> 00:29:31,520

That's how we're going to do it

330

00:29:31,680 --> 00:29:36,400

Adam sorted the hands-free capping put your forearm into that hole

331

00:29:36,960 --> 00:29:40,560

But now jamie needs to give this dry ice combo a hand

332

00:29:40,960 --> 00:29:46,160

We want to find out exactly how dangerous this is to somebody that might be holding on to it

333

00:29:46,480 --> 00:29:51,120

Obviously, we're not going to use our own hands for that. So we're going to need some artificial

hands

334

00:29:52,000 --> 00:29:53,440

beauty

335

00:29:53,440 --> 00:29:55,040

That came out perfect

336

00:29:55,040 --> 00:29:58,880

So we've got our complete set of hand molds now all we have to do is

337

00:29:59,360 --> 00:30:05,760

Put these skeletons in them and then put the tops on them and strap them together and fill them with rubber and we're good to go

338

00:30:06,400 --> 00:30:12,000

Since we're anticipating a little bit of physical damage to the hand. We might as well make it look good

339

00:30:13,840 --> 00:30:15,680

Oh, yeah

340

00:30:15,680 --> 00:30:17,680

Oh, it's so pretty

341

00:30:18,880 --> 00:30:21,280

Nice it's going to be perfect for the test. Yeah

342

00:30:22,240 --> 00:30:26,160

So now they can get hands on with their dry ice device

343

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

I'm not running for my own recreation

344

00:30:30,320 --> 00:30:31,840

Who would do that?

345

00:30:31,840 --> 00:30:33,840

No, I'm running because this is our location

346

00:30:34,400 --> 00:30:35,920

For detonating

347

00:30:35,920 --> 00:30:39,280

The dry ice pops. That's right. We've come to the bomb range

348

00:30:40,160 --> 00:30:42,560

Because that's how seriously we take the danger of these things

349

00:30:44,000 --> 00:30:49,440

It's serious because although soda bottles are designed to resist the pressure of their carbonized contents

350

00:30:50,480 --> 00:30:56,000

Expanding dry ice is a whole another ball game. Perfect. So what are we doing?

351

00:30:56,560 --> 00:30:59,280

Well, we're putting frozen co2. Yep

352

00:30:59,920 --> 00:31:05,680

This stuff known commonly as dry ice inside a sealed container along with a little bit of water

353

00:31:06,000 --> 00:31:13,520

The water converts the frozen co2 to gaseous co2 expanding to between five and 800 times its original volume

354

00:31:13,760 --> 00:31:18,240

Which will increase the pressure inside the container to in excess of 100 psi

355

00:31:18,880 --> 00:31:25,220

At which point it'll rupture violently releasing all of that gas not unlike what happens when you set off an explosive

356

00:31:25,700 --> 00:31:27,700

Boom

357

00:31:27,860 --> 00:31:34,260

Yep, so now it's time to bring some data to the equation and find out just how damaging those booms can be

358

00:31:44,980 --> 00:31:49,780

Back at the shop what is your problem things are starting to wind down

359

00:31:50,020 --> 00:31:52,020

Ah

360

00:31:53,540 --> 00:32:00,340

Keep going keep going so adam and jayme are winding them up again remember kids. This is something you can do with that extra 200

361

00:32:00,980 --> 00:32:02,980

Metronomes you've got around the house

362

00:32:03,460 --> 00:32:09,220

After 30 minutes of ticking adam tries a last ditch attempt to nudge the metronomes into sink

363

00:32:10,500 --> 00:32:12,500

Oh, look at that

364

00:32:13,460 --> 00:32:18,100

But as soon as he stops they come out of phase they're starting to run out

365

00:32:20,740 --> 00:32:24,020

Ha and it's clear this game is up

366

00:32:27,060 --> 00:32:30,980

Jamie and I starting them one at a time were able to get them all going in a couple of minutes

367

00:32:31,140 --> 00:32:37,220

But they never quite got synced up you could hear them going in phase and out of phase that was out that was out

368

00:32:37,860 --> 00:32:40,900

And certainly looking down the aisles and through the columns

369

00:32:40,980 --> 00:32:46,900

They looked awesome and they sounded amazing but they never quite got all in sync together

370

00:32:47,060 --> 00:32:49,060

I love the sound that

371

00:32:49,220 --> 00:32:51,700

This is not a successful world record attempt

372

00:32:52,180 --> 00:32:55,860

So every now and then you could hear them sort of it sounded like they were marching in step

373

00:32:55,940 --> 00:32:58,180

And then they'd march right back out of step again

374

00:32:58,660 --> 00:33:04,020

This just totally didn't work despite the high tech low friction air hockey table

375

00:33:04,260 --> 00:33:10,260

The metronomes just didn't want to synchronize so clearly while these metronomes work fine individually

376

00:33:10,340 --> 00:33:15,700

There is enough variation in the manufacturing tolerance that to get them all ticking in perfect sync

377

00:33:16,260 --> 00:33:24,500

You would have to calibrate each one individually now if you want to cross calibrate 216 metronomes by all means go ahead and give it a try

378

00:33:25,940 --> 00:33:27,940

This one's so good

379

00:33:28,820 --> 00:33:30,820

Shut up

380

00:33:30,900 --> 00:33:33,620

This is the biggest fail we have ever achieved

381

00:33:34,500 --> 00:33:36,580

All that work. Yeah, you could try this at home

382

00:33:37,300 --> 00:33:39,300

Your results may vary

383

00:33:39,700 --> 00:33:41,700

See you next time

384

00:33:45,940 --> 00:33:47,940

Now

385

00:33:53,380 --> 00:33:57,300

Now we found this one on the internet a man made a video of water coming out of a hose

386

00:33:57,540 --> 00:34:01,540

And he made the water freeze in space. I did exactly what he said to do

387

00:34:01,620 --> 00:34:02,420

I got a speaker

388

00:34:02,420 --> 00:34:06,580

I taped a hose with running water to it and then I attached it to a tone generator

389

00:34:06,660 --> 00:34:11,300

Now there's one last piece to this puzzle and that's a video camera. You ready to have your minds blown

390

00:34:15,860 --> 00:34:21,300

Now watch this I can make it go backwards. I'm gonna take it to 22 hertz. It goes backwards

391

00:34:23,380 --> 00:34:28,180

Now the whole reason this optical illusion works is for shooting 24 frames per second

392

00:34:28,340 --> 00:34:34,180

If you set the hertz around 24 it vibrates the water so that the water is in the same place every single time

393

00:34:34,340 --> 00:34:38,100

The camera takes a picture which makes it look like the water is frozen in space

394

00:34:38,500 --> 00:34:42,900

And if you play around with the hertz you could actually make it look like the water is going in reverse

395

00:34:43,060 --> 00:34:45,560

It's not really but it looks like it kind of cool

396

00:35:03,140 --> 00:35:05,140

Wow, look at that

397

00:35:06,340 --> 00:35:08,740

That is the biggest test tube I've ever seen

398

00:35:08,980 --> 00:35:16,420

Now you've seen elephant toothpaste what I'm gearing up for now is something you've never seen on television before and definitely shouldn't try at home

399

00:35:16,820 --> 00:35:18,820

That is monster toothpaste

400

00:35:19,220 --> 00:35:20,980

We're super sizing it

401

00:35:20,980 --> 00:35:22,980

Go ahead take me up

402

00:35:26,100 --> 00:35:31,940

With over 200 times the raw ingredients this will be monster toothpaste

403

00:35:32,900 --> 00:35:34,500

You guys ready?

404

00:35:34,500 --> 00:35:36,500

I think the question is are you ready?

405

00:35:37,380 --> 00:35:39,380

She looks ready do it

406

00:35:39,940 --> 00:35:41,940

Okay, here we go

407

00:35:42,820 --> 00:35:44,820

This is monster toothpaste

408

00:35:48,020 --> 00:35:50,020

Oop all right go back me up

409

00:35:55,620 --> 00:36:01,620

Nice you want a brush oh my god, that's cool. That's insane

410

00:36:02,260 --> 00:36:04,260

That was crazy

411

00:36:05,540 --> 00:36:09,940

Carried this giant test tube she poured in the potassium iodide and then the thing erupted

412

00:36:09,940 --> 00:36:15,220

I didn't think it was going to go very high, but it did and look at the messing tree. So definitely don't try this at home

413

00:36:17,940 --> 00:36:23,940

Sure monster toothpaste sounding like a good idea at the time who has to clean it up, huh?

414

00:36:32,500 --> 00:36:36,180

Just how hazardous is a dry ice device to your health?

415

00:36:36,820 --> 00:36:40,020

Well now it's time to tune into the data and find out

416

00:36:40,500 --> 00:36:44,420

So david harding and his equipment which is in the form of some pressure sensing PCBs

417

00:36:44,660 --> 00:36:49,620

Play strategically around the explosion is going to tell us exactly how powerful they are

418

00:36:50,820 --> 00:36:52,820

David you ready ready?

419

00:36:53,380 --> 00:36:58,900

All right, ice is in the bottle. The sensors are in place cameras are rolling. It's time to add water

420

00:36:59,220 --> 00:37:03,460

Just add water you better go to a safe place

421

00:37:09,060 --> 00:37:11,060

Oh, it's getting bulky

422

00:37:11,540 --> 00:37:18,020

You know, it's funny CO2 is what's normally in those soda bottles. This is sort of extreme soda, isn't it?

423

00:37:18,180 --> 00:37:21,860

Yeah, I think this one's gonna go a little quick. I hope so

424

00:37:24,740 --> 00:37:26,740

Yeah, nice

425

00:37:27,700 --> 00:37:30,100

The piece just fell down after like five seconds

426

00:37:31,380 --> 00:37:35,060

The dry ice blitz the bottom but just how bad was it?

427

00:37:37,300 --> 00:37:41,700

What do we get three psi from that explosion that's it that's all however

428

00:37:41,860 --> 00:37:45,140

It looked like it blew out the bottom where we don't have any direct sensors

429

00:37:45,620 --> 00:37:49,300

So that might be in a falsely low rating. That's right

430

00:37:49,940 --> 00:37:53,220

And as it happens we've got some more data check this out

431

00:37:53,940 --> 00:37:55,940

Oh

432

00:37:57,380 --> 00:37:59,140

No way

433

00:37:59,140 --> 00:38:00,660

That's steel

434

00:38:00,660 --> 00:38:04,900

And it's steel with an angle on it. So imagine what that would do to your hand

435

00:38:05,140 --> 00:38:09,780

I mean, that's gotta hurt and that was just a little bottle. Yeah, let's try the big one. Okay

436

00:38:10,260 --> 00:38:14,260

So the 350 mil explosion was steel bendingly strong

437

00:38:14,740 --> 00:38:21,860

But as the two liter bottle distends and elongates with the expansion of the gases will it prove even more dangerous?

438

00:38:22,500 --> 00:38:27,060

It's changing shape at the bottom. Look at that. It's gonna be a good one. Wow

439

00:38:29,700 --> 00:38:31,700

Getting longer

440

00:38:32,900 --> 00:38:34,900

That was intense

441

00:38:36,740 --> 00:38:39,940

Intense just like the data from the PCB sensors

442

00:38:40,500 --> 00:38:45,780

The sensor results from the big bottle going off or in and they're more than double what the little bottle put out

443

00:38:45,940 --> 00:38:47,940

They were seven psi

444

00:38:47,940 --> 00:38:52,980

Now that's enough to cause permanent hearing damage as to what other kind of injury it could cause

445

00:38:53,540 --> 00:38:55,780

The sensors may not be telling the full story

446

00:38:56,980 --> 00:39:01,860

Show of hands who wants to ramp it up the numbers alone say you should never try this

447

00:39:02,260 --> 00:39:05,380

But there's still the damage test to go. Yeah, I've got a prediction

448

00:39:05,860 --> 00:39:10,900

I don't think the explosion we're going to see is going to be as big as this crater that jaymie made when he arrived at work this morning

449

00:39:11,460 --> 00:39:13,460

You happy? Yeah, let's do it

450

00:39:14,340 --> 00:39:17,860

But I do think that after watching what it does to the hands on either side of the bottle

451

00:39:17,940 --> 00:39:19,940

You're not gonna want to try this at home

452

00:39:20,100 --> 00:39:27,620

Frankly, I've always wanted to do this particular experiment from the start the expansion of the co2 pushes the hands apart

453

00:39:29,140 --> 00:39:32,020

It's moving won't be long now

454

00:39:32,820 --> 00:39:34,820

Oh

455

00:39:37,700 --> 00:39:45,300

That was loud. Yeah that violent rupture sent the arms akimbo, but although they seem to flail away from the pressure

456

00:39:45,780 --> 00:39:49,060

Surely they're not undamaged by all that psi

457

00:39:51,540 --> 00:39:53,540

I got a broken wrist right here jaymie

458

00:39:54,180 --> 00:40:00,740

Yeah, I I'd say so look at it whipped it around both of these. Yeah. Yeah. Yeah, we got some lacerations here

459

00:40:01,300 --> 00:40:08,180

Maybe some broken fingers. Yeah, we got a cup of fracture in the finger. Oh and check this out. There's uh

460

00:40:08,980 --> 00:40:11,700

There's plastic embedded in the flesh, right?

461

00:40:12,180 --> 00:40:17,300

It's going to be part of what ruined your day, although you won't be able to hear anyone tell you about how stupid you just were

462

00:40:17,940 --> 00:40:19,940

Because you'll have permanent hearing damage

463

00:40:20,660 --> 00:40:24,420

Yep, not only was the force enough to force bones through flesh

464

00:40:24,980 --> 00:40:28,980

A halo of plastic shrapnel was embedded into the hands

465

00:40:29,860 --> 00:40:35,620

Look, we call this episode do try this at home because we've spent more than a decade doing all sorts of random

466

00:40:35,940 --> 00:40:38,500

Dangerous things that you should totally not try yourself

467

00:40:43,540 --> 00:40:48,420

But we had to end it here with something we hear about a lot of people doing and we wanted to make it crystal clear for you

468

00:40:48,660 --> 00:40:53,940

And we think we have that putting dry ice and water in a soda bottle is no laughing matter

469

00:40:54,020 --> 00:40:56,020

You can be permanently

470

00:40:56,100 --> 00:41:00,980

Damaged by playing around with something this dangerous. Don't do it

471

00:41:06,900 --> 00:41:13,540

So we have microwaves speed boated synchronized levitated froth suspended and exploded

472

00:41:13,940 --> 00:41:18,180

And out of all of that four are definitely too dangerous to try at home

473

00:41:18,580 --> 00:41:24,020

And when it comes to the others, please make sure you're with a responsible adult and use your common sense

474

00:41:26,020 --> 00:41:28,820

You