

1

00:00:00,000 --> 00:00:09,000

Music

2

00:00:09,000 --> 00:00:10,000

Don't!

3

00:00:10,000 --> 00:00:17,000

Music

4

00:00:17,000 --> 00:00:18,000

Seen it?

5

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

This is so f\*\*\*ing...

6

00:00:20,000 --> 00:00:22,000

Definitely no.

7

00:00:22,000 --> 00:00:27,000

Music

8

00:00:27,000 --> 00:00:28,000

No!

9

00:00:28,000 --> 00:00:39,000

Music

10

00:00:39,000 --> 00:00:40,000

No.

11

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

Nope.

12

00:00:41,000 --> 00:00:42,000

Boring.

13

00:00:42,000 --> 00:00:45,000

So many channels, nothing's on.

14

00:00:45,000 --> 00:00:47,000

Music

15

00:00:47,000 --> 00:00:49,000

Welcome to the Myth Crackers.

16

00:00:49,000 --> 00:00:55,000

Music

17

00:00:55,000 --> 00:00:57,000

That was fun being on that show.

18

00:00:57,000 --> 00:00:59,000

What was it we were trying to prove again?

19

00:00:59,000 --> 00:01:00,000

Don't know, don't care.

20

00:01:00,000 --> 00:01:03,000

Music

21

00:01:03,000 --> 00:01:05,000

But you know what I was thinking?

22

00:01:05,000 --> 00:01:08,000

If we did their show, shouldn't they do our show?

23

00:01:08,000 --> 00:01:10,000

A Simpson special?

24

00:01:10,000 --> 00:01:11,000

Absolutely.

25

00:01:11,000 --> 00:01:12,000

Music

26

00:01:12,000 --> 00:01:13,000

Let's do it.

27

00:01:13,000 --> 00:01:14,000

Music

28

00:01:14,000 --> 00:01:42,000

Music

29

00:01:42,000 --> 00:01:43,000

Hi.

30

00:01:43,000 --> 00:01:44,000

Hey.

31

00:01:44,000 --> 00:01:45,000

Who's this?

32

00:01:45,000 --> 00:01:46,000

It's Al Jean.

33

00:01:46,000 --> 00:01:47,000

Okay.

34

00:01:47,000 --> 00:01:48,000

Hi Al.

35

00:01:48,000 --> 00:01:49,000

Pleased to meet you.

36

00:01:49,000 --> 00:01:51,000

Jamie, it's Al Jean.

37

00:01:51,000 --> 00:01:52,000

I'm sorry.

38

00:01:52,000 --> 00:01:56,000

The executive producer and the showrunner of the best animated series ever in the longest

39

00:01:56,000 --> 00:01:59,000

running scripted show on television, The Simpsons?

40

00:01:59,000 --> 00:02:00,000

Oh, The Simpsons.

41

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

Welcome AI.

42

00:02:01,000 --> 00:02:04,000

You were thinking South Park.

43

00:02:04,000 --> 00:02:06,000

So, are we going to be animating?

44

00:02:06,000 --> 00:02:11,000

No, look, their writing staff is packed with science and math cakes, right?

45

00:02:11,000 --> 00:02:15,000

And they try and hold the laws of physics, right?

46

00:02:15,000 --> 00:02:16,000

Yeah.

47

00:02:16,000 --> 00:02:17,000

Conservation of math, it's the law.

48

00:02:17,000 --> 00:02:20,000

Ish, we're going to do a couple of stories from The Simpsons.

49

00:02:20,000 --> 00:02:21,000

Like what?

50

00:02:21,000 --> 00:02:25,000

Okay, we've got one where Bart throws a lit cherry bomb into the sewer system of the

51

00:02:25,000 --> 00:02:27,000

school and turns all of the toilets into geysers.

52

00:02:27,000 --> 00:02:30,000

My favorite episodes, The Crepes of Red.

53

00:02:30,000 --> 00:02:31,000

Okay, that works.

54

00:02:31,000 --> 00:02:32,000

What else?

55

00:02:32,000 --> 00:02:37,000

We have another one where Homer protects his house from a 5,000 pound wrecking ball by

56

00:02:37,000 --> 00:02:41,000

putting his body between the wrecking ball and the house.

57

00:02:41,000 --> 00:02:44,000

So, cartoon physics in the real world.

58

00:02:44,000 --> 00:02:46,000

That's Jamie excited.

59

00:02:46,000 --> 00:02:47,000

He's excited to get out of this room.

60

00:02:47,000 --> 00:02:48,000

Yeah, problem.

61

00:02:54,000 --> 00:02:58,000

Now, it is one thing to look at physics from the movie world and see how realistic they

62

00:02:58,000 --> 00:02:59,000

are in the real world.

63

00:02:59,000 --> 00:03:02,000

It's another entirely to try that with a cartoon.

64

00:03:02,000 --> 00:03:07,000

And in investigating Homer versus the wrecking ball, Jamie's tackling the wrecking ball.

65

00:03:07,000 --> 00:03:14,000

And I've got to build a full-size Homer with all the same dimensions, body mass and water

66

00:03:14,000 --> 00:03:19,000

content as if Homer was a real person.

67

00:03:19,000 --> 00:03:26,000

Yep, to determine the kinetic energy implications of Homer's heroic intervention, the size and

68

00:03:26,000 --> 00:03:32,000

mass of the key animated elements have to be accurately translated from Springfield to

69

00:03:32,000 --> 00:03:34,000

the real world.

70

00:03:34,000 --> 00:03:39,000

So Al, we really strive to be as accurate as possible on this show.

71

00:03:39,000 --> 00:03:46,000

So I'm hoping you can supply us with some real world dimensions of Homer.

72

00:03:46,000 --> 00:03:49,000

Lights, how tall is he?

73

00:03:49,000 --> 00:03:50,000

Well, you have to be really accurate.

74

00:03:50,000 --> 00:03:52,000

He's 5'11", and that's what the animators always use.

75

00:03:52,000 --> 00:03:53,000

What about his shoe size?

76

00:03:53,000 --> 00:03:54,000

11 and a half.

77

00:03:54,000 --> 00:03:56,000

Those are almost exactly my dimensions.

78

00:03:56,000 --> 00:04:00,000

Well, the good news for you is you have less stomach and more hair.

79

00:04:00,000 --> 00:04:04,000

Speaking of his stomach, how much does Homer actually weigh?

80

00:04:04,000 --> 00:04:07,000

Well, about 240, but we think 239 is funnier.

81

00:04:07,000 --> 00:04:09,000

So 239.

82

00:04:09,000 --> 00:04:17,000

Ladies and gentlemen, this is Homer Simpson, full-size.

83

00:04:17,000 --> 00:04:18,000

Al, thank you so much.

84

00:04:18,000 --> 00:04:19,000

I'm going to leave you alone with the donuts.

85

00:04:19,000 --> 00:04:20,000

Is that okay?

86

00:04:20,000 --> 00:04:21,000

They'll be gone when you're back.

87

00:04:21,000 --> 00:04:24,000

Mmm, donuts.

88

00:04:24,000 --> 00:04:34,000

Armed with Homer's exact specs, Adam commences the construction of an animated American icon.

89

00:04:34,000 --> 00:04:37,000

USA! USA!

90

00:04:37,000 --> 00:04:39,000

Starting with upholstery foam.

91

00:04:39,000 --> 00:04:41,000

That's pretty good.

92

00:04:41,000 --> 00:04:47,000

Adam utilizes a method with familiar, family-friendly results.

93

00:04:47,000 --> 00:04:52,000

This technique that I'm using of gluing an open-cell urethane foam to itself

94

00:04:52,000 --> 00:04:56,000

is referred to as additive foam building.

95

00:04:56,000 --> 00:04:59,000

Because instead of casting and mold making in flexible foam,

96

00:04:59,000 --> 00:05:04,000

I'm physically building the parts that I need out of sheet foam.

97

00:05:04,000 --> 00:05:09,000

What you might not know, this is how all your muppets were made.

98

00:05:09,000 --> 00:05:10,000

Yep.

99

00:05:10,000 --> 00:05:12,000

Same technique.

100

00:05:12,000 --> 00:05:13,000

There we go.

101

00:05:13,000 --> 00:05:16,000

Do I look like Homer at all?

102

00:05:16,000 --> 00:05:18,000

Hi.

103

00:05:18,000 --> 00:05:23,000

Oh!

104

00:05:23,000 --> 00:05:28,000

With the arms starting to take shape, it's on to Homer's famously tubby torso.

105

00:05:28,000 --> 00:05:32,000

One, two, three, four, and five.

106

00:05:32,000 --> 00:05:35,000

It doesn't look like much, but that's going to be Homer soon.

107

00:05:35,000 --> 00:05:40,000

A series of cylindrical discs glued together form the tapered shape.

108

00:05:40,000 --> 00:05:41,000

Let's go.

109

00:05:41,000 --> 00:05:42,000

Yeah!

110

00:05:42,000 --> 00:05:45,000

The human-like mass and density will come later.

111

00:05:45,000 --> 00:05:48,000

For now, Adam's immersed in his art.

112

00:05:48,000 --> 00:05:51,000

I know exactly what it feels like to be Michelangelo.

113

00:05:51,000 --> 00:05:54,000

Well, maybe not exactly, but just like a little bit.

114

00:05:54,000 --> 00:05:56,000

If he carved in foam, it made cartoon characters.

115

00:05:56,000 --> 00:06:02,000

This is what we call a shop shower.

116

00:06:09,000 --> 00:06:12,000

Next, the arms are attached to shoulder joints.

117

00:06:13,000 --> 00:06:20,000

And the legs are measured, cut, and positioned on the posterior.

118

00:06:20,000 --> 00:06:22,000

That's it, ladies and gentlemen.

119

00:06:22,000 --> 00:06:25,000

And with those foam pieces of the puzzle in place.

120

00:06:25,000 --> 00:06:27,000

All right, I'm pretty happy with that.

121

00:06:27,000 --> 00:06:29,000

That's looking a lot like Homer.

122

00:06:29,000 --> 00:06:32,000

Adam heads out for help with Homer's head.

123

00:06:32,000 --> 00:06:36,000

This is the center of what used to be industrial light and magic.

124

00:06:36,000 --> 00:06:40,000

Now, behind that blue door is legendary machinist, Merrick Cheney,

125

00:06:40,000 --> 00:06:44,000

who built armatures for the stop-motion films Nightmare Before Christmas

126

00:06:44,000 --> 00:06:50,000

and a million other movies, and he's going to help us get Homer's head screwed on right.

127

00:06:50,000 --> 00:06:52,000

So, Merrick, how's this going to work?

128

00:06:52,000 --> 00:06:55,000

So, we've taken your model of Homer's head.

129

00:06:55,000 --> 00:07:01,000

I've converted it into a machine-able file, and I've cut it up into, like, eight chunks.

130

00:07:01,000 --> 00:07:02,000

That is cool.

131

00:07:02,000 --> 00:07:06,000

And they all fit together kind of like a three-dimensional puzzle.

132

00:07:06,000 --> 00:07:09,000

And that eight-piece puzzle will form a central cavity,

133

00:07:09,000 --> 00:07:14,000

a negative space mold of Homer's ironically large cranium.

134

00:07:14,000 --> 00:07:22,000

So, there you go. That is mold block number one comprising the bottom left side of Homer's face, the front part.

135

00:07:22,000 --> 00:07:24,000

That's number one of eight.

136

00:07:24,000 --> 00:07:30,000

While Adam waits for all eight, the Heinemann has been concocting an ingenious plan.

137

00:07:30,000 --> 00:07:35,000

In the cartoon, Homer appears to be on a wrecking ball that's about as tall as he is.

138

00:07:35,000 --> 00:07:41,000

And because it's so much larger than a real-world wrecking ball, I've got to make my own.

139

00:07:41,000 --> 00:07:46,000

And that's not exactly an easy task, but I've got an idea.

140

00:07:46,000 --> 00:07:48,000

Easy as pie.

141

00:07:48,000 --> 00:07:54,000

The task at hand is to build a custom wrecking ball the same dimensions as the one in the clip,

142

00:07:54,000 --> 00:07:58,000

but weighing in at a realistic 5,000 pounds.

143

00:07:58,000 --> 00:08:01,000

So, are you starting to get the picture?

144

00:08:01,000 --> 00:08:07,000

It's a unique manufacturing assignment the Heinemann is tackling in his own unique way.

145

00:08:07,000 --> 00:08:11,000

There are a lot of different ways of making a big heavy ball,

146

00:08:11,000 --> 00:08:18,000

but the quickest and easiest way I know of to do it would be with steel reinforced concrete.

147

00:08:18,000 --> 00:08:21,000

Now, to do that, you need a mold.

148

00:08:21,000 --> 00:08:27,000

And I've come up with an idea of creating what amounts to a hemispherical shaped auger

149

00:08:27,000 --> 00:08:30,000

that I can chuck onto the back of some earth-moving equipment

150

00:08:30,000 --> 00:08:34,000

and dig two hemispherical holes right in the ground.

151

00:08:34,000 --> 00:08:38,000

It looks like it might sort of just make it.

152

00:08:38,000 --> 00:08:41,000

Ha ha ha ha ha.

153

00:08:41,000 --> 00:08:47,000

We pour our concrete in there around a steel armature, let it cure, put them together,

154

00:08:47,000 --> 00:08:52,000

and you've got a ball, one big-ass heavy ball.

155

00:08:52,000 --> 00:08:55,000

Yep, to make two hemispherical molds...

156

00:08:55,000 --> 00:08:57,000

It's working!

157

00:08:57,000 --> 00:09:00,000

For the two halves of the concrete wrecking ball...

158

00:09:00,000 --> 00:09:02,000

That's what I'm talking about.

159

00:09:02,000 --> 00:09:06,000

Jamie's designed and constructed a one-of-a-kind tool.

160

00:09:06,000 --> 00:09:09,000

This is working great!

161

00:09:09,000 --> 00:09:12,000

Ha ha ha ha.

162

00:09:12,000 --> 00:09:14,000

Ha ha ha.

163

00:09:14,000 --> 00:09:16,000

Next!

164

00:09:16,000 --> 00:09:19,000

The rig didn't break.

165

00:09:19,000 --> 00:09:24,000

It's made of nice symmetrical half-spir.

166

00:09:24,000 --> 00:09:28,000

It's clearly solid enough to have the concrete poured in it.

167

00:09:28,000 --> 00:09:30,000

It's perfect!

168

00:09:30,000 --> 00:09:33,000

Which is what's going to happen pretty much next.

169

00:09:37,000 --> 00:09:39,000

Oh, look at that!

170

00:09:39,000 --> 00:09:45,000

The steel armature, made back at the shop, will provide structure for the concrete half-shells.

171

00:09:45,000 --> 00:09:49,000

And you could say the Heidemann is happy.

172

00:09:49,000 --> 00:09:53,000

This is working exactly like I had in mind.

173

00:09:55,000 --> 00:09:58,000

Normally, if you want to make a big sphere like this,

174

00:09:58,000 --> 00:10:02,000

you'd start off with a big chunk of foam, you'd carve it into a sphere.

175

00:10:02,000 --> 00:10:04,000

Our little hose are perfect.

176

00:10:04,000 --> 00:10:11,000

You'd put fiberglass over it, and then you'd make another mold of the interior cavity,

177

00:10:11,000 --> 00:10:17,000

and it'd take several people pretty much all week long just to accomplish this.

178

00:10:17,000 --> 00:10:22,000

Instead of doing that, we just dug a hole.

179

00:10:22,000 --> 00:10:24,000

I'm just saying.

180

00:10:24,000 --> 00:10:27,000

With the concrete shaped and edged with matching seams,

181

00:10:27,000 --> 00:10:31,000

Phase 1 of Jamie's big ball is complete.

182

00:10:31,000 --> 00:10:34,000

Now that has to sit for about a week and a half,

183

00:10:34,000 --> 00:10:36,000

and then we're going to pull that one out,

184

00:10:36,000 --> 00:10:40,000

turn it upside down, and put it on top of this one.

185

00:10:40,000 --> 00:10:45,000

And we'll bond the two things together, and we've got a wrecking ball.

186

00:10:45,000 --> 00:10:49,000

With two weeks before Jamie can wreak wrecking ball havoc,

187

00:10:49,000 --> 00:10:54,000

it's back to the shop for part two of this Springfield Spectacular.

188

00:10:54,000 --> 00:10:55,000

So what's next?

189

00:10:55,000 --> 00:10:56,000

Toilet bomb.

190

00:10:56,000 --> 00:10:58,000

Al, you want to do the honors?

191

00:10:58,000 --> 00:10:59,000

Thank you, Adam.

192

00:10:59,000 --> 00:11:03,000

Well, in one of the early episodes of The Simpsons, Bart flushes a cherry bomb down the toilet.

193

00:11:03,000 --> 00:11:05,000

So long, sucker!

194

00:11:05,000 --> 00:11:10,000

And it immediately sends geysers of water shooting out of every toilet on the block.

195

00:11:13,000 --> 00:11:16,000

So explosives and toilets.

196

00:11:16,000 --> 00:11:19,000

I'm thinking we should start small scale.

197

00:11:19,000 --> 00:11:21,000

I totally agree.

198

00:11:24,000 --> 00:11:27,000

I am licensed to drive this.

199

00:11:27,000 --> 00:11:28,000

Oh, whoop.

200

00:11:30,000 --> 00:11:33,000

The myth is that an explosion will travel through a plumbing system

201

00:11:33,000 --> 00:11:36,000

causing multiple geysers out of the toilets.

202

00:11:37,000 --> 00:11:42,000

That's the bowl, and that's where the magic happens.

203

00:11:42,000 --> 00:11:45,000

And to test that, we're going to do three things.

204

00:11:46,000 --> 00:11:49,000

Number one, I'm going to make three transparent working toilets

205

00:11:49,000 --> 00:11:52,000

so we can really see what happens when things go boom.

206

00:11:52,000 --> 00:11:59,000

Number two, I'm going to connect them with an accurate waste disposal system.

207

00:12:00,000 --> 00:12:02,000

Two more like that, if we're good to go.

208

00:12:02,000 --> 00:12:08,000

And finally, we're going to be introducing a cherry bomb-like explosion into that system.

209

00:12:08,000 --> 00:12:11,000

And, well, then we're going to see what we see.

210

00:12:11,000 --> 00:12:16,000

Recreating Springfield Elementary's plumbing system sounds elementary.

211

00:12:16,000 --> 00:12:18,000

Melting my brain.

212

00:12:19,000 --> 00:12:21,000

But it's anything but.

213

00:12:22,000 --> 00:12:26,000

I'm trying to work out how to do this, and because I'm molding it,

214

00:12:26,000 --> 00:12:28,000

effectively I have to think upside down and backwards.

215

00:12:28,000 --> 00:12:33,000

So the negative space here, you see, I'm going to fill with a stone plaster.

216

00:12:33,000 --> 00:12:38,000

So that when the stone plaster sets, I'll pull out all the bead foam

217

00:12:38,000 --> 00:12:44,000

and I'll be left with a toilet negative, the front to which I will mount a piece of acrylic.

218

00:12:44,000 --> 00:12:45,000

Excellent.

219

00:12:45,000 --> 00:12:47,000

So that we can see what's happening in the toilet.

220

00:12:47,000 --> 00:12:49,000

It's going to be freaking awesome.

221

00:12:50,000 --> 00:12:54,000

And after the plaster is set, the negative space molds are removed.

222

00:12:54,000 --> 00:12:56,000

Okay, one.

223

00:12:56,000 --> 00:12:58,000

To reveal the balls.

224

00:12:58,000 --> 00:12:59,000

Number two.

225

00:12:59,000 --> 00:13:01,000

Number two, get it?

226

00:13:01,000 --> 00:13:03,000

Because in a, never mind.

227

00:13:03,000 --> 00:13:09,000

Add once they're cleaned up and dried out.

228

00:13:11,000 --> 00:13:13,000

A little bit of an oven.

229

00:13:14,000 --> 00:13:20,000

Adam mounts them and seals the system with a transparent sheet of half inch acrylic.

230

00:13:20,000 --> 00:13:23,000

I get excited about a good experimental rig.

231

00:13:26,000 --> 00:13:27,000

There we go.

232

00:13:27,000 --> 00:13:32,000

She is a freestanding, my freestanding toilet sculptor.

233

00:13:32,000 --> 00:13:35,000

I think it's time to flush a toilet.

234

00:13:35,000 --> 00:13:37,000

So I'm stuck here.

235

00:13:37,000 --> 00:13:40,000

I'm going to watch one of these work right now.

236

00:13:43,000 --> 00:13:48,000

Now, right here, this is where the important part of the functionality of a toilet is about to happen.

237

00:13:48,000 --> 00:13:53,000

We think of toilets as like, there's water and it's water all the way down, but it's not.

238

00:13:53,000 --> 00:13:57,000

Toilet systems are mostly air and here's how it works.

239

00:13:57,000 --> 00:14:04,000

If you put more liquid in the system, then it can handle, it just spills over here.

240

00:14:04,000 --> 00:14:09,000

Now if I flush this toilet by putting more water in, check out what happens.

241

00:14:10,000 --> 00:14:12,000

That works just like a toilet!

242

00:14:14,000 --> 00:14:17,000

But that's only half the story.

243

00:14:20,000 --> 00:14:25,000

Now that the toilets are finished and actually working, it's time to plumb them into a system.

244

00:14:25,000 --> 00:14:26,000

Excellent.

245

00:14:26,000 --> 00:14:33,000

Okay, see the toilets in Bart's school would have all been connected to a central set of pipes.

246

00:14:33,000 --> 00:14:36,000

That's what I'm about to build in scale.

247

00:14:37,000 --> 00:14:40,000

So here we go, go, go, go, go, go.

248

00:14:41,000 --> 00:14:43,000

You're supposed to cut.

249

00:14:43,000 --> 00:14:46,000

The plumbing beneath the bowls is crucial.

250

00:14:46,000 --> 00:14:47,000

Good.

251

00:14:47,000 --> 00:14:55,000

To accurately model the pressure wave effects of Bart's bomb, it has to be set up just like a three-stall school sewage system.

252

00:14:55,000 --> 00:15:01,000

Complete with two crucial effluent outflows, the system has multiple exits for the blast.

253

00:15:02,000 --> 00:15:08,000

And with that, this Simpson special Game of Thrones Fire in the Bowl.

254

00:15:08,000 --> 00:15:10,000

Explosion in three.

255

00:15:10,000 --> 00:15:12,000

Is ready for blast off. Go.

256

00:15:19,000 --> 00:15:21,000

Welcome to the Myth Crackers.

257

00:15:21,000 --> 00:15:24,000

Adam and Jamie have hit Springfield again.

258

00:15:24,000 --> 00:15:28,000

Tonight we take on the classic myth that a cat will always land on its feet.

259

00:15:29,000 --> 00:15:34,000

But this time, instead of experimenting as animated characters...

260

00:15:34,000 --> 00:15:36,000

What was it we were trying to prove again?

261

00:15:36,000 --> 00:15:38,000

Don't know, don't care.

262

00:15:40,000 --> 00:15:43,000

They're animatively experimenting.

263

00:15:44,000 --> 00:15:48,000

And with a transparent trio of toilets ready to blow,

264

00:15:49,000 --> 00:15:54,000

they want to know if Bart's bomb could have really gushed multiple geysers.

265

00:15:57,000 --> 00:16:00,000

Now what happens when you flush a cherry bomb down one of these toilets?

266

00:16:00,000 --> 00:16:04,000

Well, it's going to go down through the plumbing and it could blow anywhere.

267

00:16:04,000 --> 00:16:07,000

It could blow here, it could blow here, it could blow down there.

268

00:16:07,000 --> 00:16:09,000

That's actually what these black caps are.

269

00:16:09,000 --> 00:16:14,000

These are places in the plumbing system we can introduce the pressure from the cherry bomb.

270

00:16:14,000 --> 00:16:16,000

But we're not going to use a cherry bomb.

271

00:16:16,000 --> 00:16:17,000

Not in my shop, we're not.

272

00:16:17,000 --> 00:16:19,000

Number one, it's illegal.

273

00:16:19,000 --> 00:16:25,000

And number two, it's potentially dangerous and definitely very messy.

274

00:16:25,000 --> 00:16:28,000

So we're going to need a little bit more control if we're going to do it here.

275

00:16:28,000 --> 00:16:32,000

For that, we have my little pop gun, which has a fast-acting valve on it

276

00:16:32,000 --> 00:16:35,000

that releases a blast of pressurized air.

277

00:16:37,000 --> 00:16:39,000

And that's essentially what an explosion does.

278

00:16:39,000 --> 00:16:43,000

It creates a volume of rapidly expanding gases in a pressure wave.

279

00:16:43,000 --> 00:16:47,000

So we're going to plumb my little pop gun into Adam's rig in various places,

280

00:16:47,000 --> 00:16:50,000

adjust the pressure and see what happens.

281

00:16:50,000 --> 00:16:51,000

20 psi?

282

00:16:51,000 --> 00:16:53,000

Yeah, that's a big fat dump.

283

00:16:54,000 --> 00:16:55,000

Of pressure.

284

00:16:57,000 --> 00:16:58,000

Nice.

285

00:16:58,000 --> 00:16:59,000

Let me know when you're ready.

286

00:16:59,000 --> 00:17:01,000

All right, I'm going to count it down.

287

00:17:01,000 --> 00:17:10,000

Cherry bomb, half-scale toilet experiment, position number one, explosion in three, two, one, go.

288

00:17:13,000 --> 00:17:22,000

A simultaneous tsunami and the physics of Springfield are looking surprisingly accurate.

289

00:17:22,000 --> 00:17:25,000

This first test showed that pressure delivered to the middle toilet

290

00:17:25,000 --> 00:17:29,000

was pretty evenly distributed to the other toilets around it.

291

00:17:29,000 --> 00:17:30,000

It's quite pretty, actually.

292

00:17:30,000 --> 00:17:33,000

Yeah, it's like a little bit of a water ballet.

293

00:17:33,000 --> 00:17:35,000

Some sort of modern art.

294

00:17:36,000 --> 00:17:41,000

Now we want to know what would happen if the cherry bomb and its pressure went here or here.

295

00:17:41,000 --> 00:17:43,000

Would that make any difference?

296

00:17:46,000 --> 00:17:51,000

I don't know about you folks, but whenever I go to the toilet, I always take my umbrella.

297

00:17:51,000 --> 00:18:01,000

Half-scale cherry bomb toilet experiment, position number two, two, explosion in three, two, one, go.

298

00:18:05,000 --> 00:18:07,000

That's very satisfying.

299

00:18:08,000 --> 00:18:11,000

Another successful concurrent eruption.

300

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

Position number three, go.

301

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

One that's replicated regardless of where the explosion originates.

302

00:18:20,000 --> 00:18:23,000

Which kind of makes sense because there's resistance in each of these toilets,

303

00:18:23,000 --> 00:18:28,000

and so with multiple inlets, that resistance is going to tend to equalize the pressure.

304

00:18:28,000 --> 00:18:29,000

Yeah.

305

00:18:29,000 --> 00:18:33,000

The pressure spread is plausible, but Adam has an issue with volume.

306

00:18:33,000 --> 00:18:38,000

Now, up until now, we've been experimenting with a properly set up plumbing system,

307

00:18:38,000 --> 00:18:41,000

but it's not quite the fountain of water that we see in the show

308

00:18:41,000 --> 00:18:44,000

because there's just not enough water in the system.

309

00:18:44,000 --> 00:18:47,000

But what if there is a clog in the system?

310

00:18:47,000 --> 00:18:48,000

Here we go.

311

00:18:48,000 --> 00:18:53,000

The clog could have water backed up in that system, and the cherry bomb could go in that,

312

00:18:53,000 --> 00:18:55,000

and then it's pushing water.

313

00:18:56,000 --> 00:18:57,000

What do you think?

314

00:18:57,000 --> 00:18:59,000

That's about got it.

315

00:18:59,000 --> 00:19:00,000

All right.

316

00:19:00,000 --> 00:19:02,000

What happens to that water? Does it come out of the toilets?

317

00:19:02,000 --> 00:19:06,000

I kind of think so, but we're going to try it just to make sure.

318

00:19:06,000 --> 00:19:07,000

All right.

319

00:19:07,000 --> 00:19:09,000

This is a fully clogged toilet system.

320

00:19:09,000 --> 00:19:12,000

Three, two, one, go.

321

00:19:20,000 --> 00:19:23,000

I think we found the explosion we were looking for.

322

00:19:33,000 --> 00:19:36,000

Well, aside from being pretty to look at,

323

00:19:36,000 --> 00:19:39,000

our half scale system has demonstrated exactly what we were hoping,

324

00:19:39,000 --> 00:19:43,000

and that is the Simpsons like fountain water shooting out of the toilet behavior

325

00:19:43,000 --> 00:19:46,000

from a cherry bomb thrown into the system.

326

00:19:49,000 --> 00:19:51,000

So I think we're going to go full scale.

327

00:19:51,000 --> 00:19:55,000

I think we're going to detonate our cherry bomb back behind some clogged up water.

328

00:19:55,000 --> 00:19:57,000

The questions we have when we go to full scale,

329

00:19:57,000 --> 00:20:01,000

will the cherry bomb actually generate the pressure we need?

330

00:20:01,000 --> 00:20:05,000

We don't know. That's why we're going to do it.

331

00:20:05,000 --> 00:20:06,000

Excuse me.

332

00:20:06,000 --> 00:20:07,000

Sorry.

333

00:20:10,000 --> 00:20:12,000

While the crew completes the cleanup,

334

00:20:15,000 --> 00:20:19,000

the epic odyssey of Hull's heroic intervention continues,

335

00:20:20,000 --> 00:20:23,000

because Jamie's big ball has hardened,

336

00:20:24,000 --> 00:20:28,000

and his distinctly unconventional plan was paid off.

337

00:20:29,000 --> 00:20:31,000

It's looking pretty good.

338

00:20:32,000 --> 00:20:34,000

Next, he makes the two halves a hull,

339

00:20:34,000 --> 00:20:37,000

and seals the deal with a super strong sealant.

340

00:20:37,000 --> 00:20:43,000

This is a specially formulated epoxy for anchoring things in concrete.

341

00:20:46,000 --> 00:20:49,000

So my plan worked exactly as I had in mind,

342

00:20:49,000 --> 00:20:51,000

and we've got a nice spherical shape.

343

00:20:59,000 --> 00:21:01,000

A little chiseling and a little mortar,

344

00:21:01,000 --> 00:21:03,000

and this thing will clean up real nice,

345

00:21:03,000 --> 00:21:06,000

and we'll have one heck of a big wrecking ball.

346

00:21:06,000 --> 00:21:09,000

With that, Jamie heads back to the shop,

347

00:21:09,000 --> 00:21:11,000

where Homer's head has just arrived.

348

00:21:11,000 --> 00:21:15,000

Dude, look at that. That is so pretty.

349

00:21:15,000 --> 00:21:17,000

That's a nice smooth surface.

350

00:21:17,000 --> 00:21:20,000

Now that we have these lovely molds of Homer's head,

351

00:21:20,000 --> 00:21:23,000

we're going to coat the insides with a tinsid latex,

352

00:21:23,000 --> 00:21:25,000

because that'll give us the correct color,

353

00:21:25,000 --> 00:21:27,000

and also a nice tough skin.

354

00:21:28,000 --> 00:21:30,000

Once the latex skin is dried,

355

00:21:30,000 --> 00:21:33,000

Jamie fills Homer's head with a two-part pouring foam.

356

00:21:35,000 --> 00:21:38,000

Now this stuff expands about four to one,

357

00:21:38,000 --> 00:21:43,000

and it's a little hard to estimate Homer's head volume.

358

00:21:43,000 --> 00:21:46,000

All I can see is that it's much larger than mine,

359

00:21:46,000 --> 00:21:48,000

as hard as that is to believe.

360

00:21:48,000 --> 00:21:50,000

You want to help me pull this thing apart?

361

00:21:50,000 --> 00:21:53,000

Fifteen minutes later, the foam is set.

362

00:21:53,000 --> 00:21:55,000

There you go. Come in.

363

00:21:55,000 --> 00:21:58,000

And Homer's precisely proportioned profile

364

00:21:58,000 --> 00:22:00,000

is revealed in all its glory.

365

00:22:00,000 --> 00:22:02,000

It's kind of heavy.

366

00:22:02,000 --> 00:22:06,000

That looks awesome. Totally fantastic.

367

00:22:06,000 --> 00:22:08,000

For the finishing touches,

368

00:22:08,000 --> 00:22:12,000

Jamie paints Homer's famously unshaven mug.

369

00:22:12,000 --> 00:22:14,000

Starting to look like Homer.

370

00:22:14,000 --> 00:22:17,000

Adam coats his torso with waterproof rubber,

371

00:22:17,000 --> 00:22:20,000

and Jamie adds the ears

372

00:22:20,000 --> 00:22:23,000

and those instantly recognizable eyes.

373

00:22:23,000 --> 00:22:26,000

It kind of comes to life when you do that.

374

00:22:29,000 --> 00:22:33,000

So Homer is very, very nearly complete.

375

00:22:33,000 --> 00:22:36,000

We've painted all of his body parts, including his head,

376

00:22:36,000 --> 00:22:39,000

and now his hands, a suitable shade of Simpson's yellow.

377

00:22:39,000 --> 00:22:42,000

After this, we'll send his measurements out to our seamstress

378

00:22:42,000 --> 00:22:44,000

to make him a full set of clothes.

379

00:22:44,000 --> 00:22:47,000

Then it's time to take him out to the location and abuse him.

380

00:22:50,000 --> 00:22:52,000

No!

381

00:22:58,000 --> 00:23:02,000

To recap, Homer supposedly protects his house

382

00:23:02,000 --> 00:23:06,000

by placing himself between a wrecking ball and his house

383

00:23:06,000 --> 00:23:09,000

and absorbing the shock with his body.

384

00:23:09,000 --> 00:23:11,000

In order to test this, we are absolutely, of course,

385

00:23:11,000 --> 00:23:13,000

going to need a wrecking ball.

386

00:23:13,000 --> 00:23:15,000

Check.

387

00:23:15,000 --> 00:23:17,000

Well, that's a big-ass ball.

388

00:23:17,000 --> 00:23:21,000

We're also going to need a house to swing this wrecking ball into.

389

00:23:28,000 --> 00:23:30,000

So we decided to build our own.

390

00:23:30,000 --> 00:23:32,000

Actually, we built two.

391

00:23:32,000 --> 00:23:35,000

We'll always paint some before we destroy it.

392

00:23:35,000 --> 00:23:38,000

There's a very good reason, because what we want to find out

393

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

is whether Homer would have made any difference

394

00:23:40,000 --> 00:23:42,000

to the wrecking ball's effect on his house.

395

00:23:42,000 --> 00:23:45,000

All right, let's go.

396

00:23:45,000 --> 00:23:47,000

Therefore, that's our control house.

397

00:23:47,000 --> 00:23:50,000

We're going to swing just a straight-ol wrecking ball into it.

398

00:23:50,000 --> 00:23:53,000

It's only when we get to this one that we're going to strap Homer

399

00:23:53,000 --> 00:23:56,000

to that wrecking ball and find out if the amount of destruction

400

00:23:56,000 --> 00:23:59,000

is actually different, i.e., less on this one.

401

00:23:59,000 --> 00:24:02,000

Now, it's a home worth protecting.

402

00:24:02,000 --> 00:24:05,000

Yeah! Perfect!

403

00:24:05,000 --> 00:24:07,000

In the demolition industry,

404

00:24:07,000 --> 00:24:10,000

we've had a lot of people who have been using the wrecking ball

405

00:24:10,000 --> 00:24:12,000

for a long time.

406

00:24:12,000 --> 00:24:15,000

In the demolition industry, wrecking balls are kind of iconic.

407

00:24:15,000 --> 00:24:18,000

Jamie wirebrushes his balls every morning.

408

00:24:18,000 --> 00:24:22,000

But we've come to find out that they don't actually use them that much anymore.

409

00:24:22,000 --> 00:24:25,000

Now, it looks like it's all business.

410

00:24:25,000 --> 00:24:28,000

And when you think about it, it's sort of understandable.

411

00:24:28,000 --> 00:24:30,000

There we go!

412

00:24:30,000 --> 00:24:34,000

Because you get thousands of pounds of weight swinging on the end of a cable,

413

00:24:34,000 --> 00:24:37,000

it's not exactly a precision instrument.

414

00:24:37,000 --> 00:24:40,000

Right on the money, 5,000 pounds is perfect.

415

00:24:40,000 --> 00:24:43,000

Not only that, it's hard on the equipment that swings it.

416

00:24:43,000 --> 00:24:45,000

Grrr!

417

00:24:45,000 --> 00:24:47,000

Ah!

418

00:24:47,000 --> 00:24:53,000

So, we've found that whenever we need a wrecking ball, we make our own.

419

00:24:53,000 --> 00:24:58,000

With their accurately sized and weighted, home-made Homer wrecker

420

00:24:58,000 --> 00:25:00,000

ready to swing into action.

421

00:25:00,000 --> 00:25:02,000

I love having the right hardware.

422

00:25:02,000 --> 00:25:05,000

It's simply a question of lifting it.

423

00:25:05,000 --> 00:25:07,000

I'll hold it up in case it falls.

424

00:25:07,000 --> 00:25:08,000

Awesome.

425

00:25:08,000 --> 00:25:10,000

Pulling it back and letting it go.

426

00:25:10,000 --> 00:25:11,000

Right?

427

00:25:11,000 --> 00:25:13,000

Ray, how do you feel about it?

428

00:25:13,000 --> 00:25:14,000

You like it?

429

00:25:14,000 --> 00:25:15,000

Wrong.

430

00:25:15,000 --> 00:25:18,000

If it goes out too far, it's going to want to bring the crane over.

431

00:25:18,000 --> 00:25:19,000

You understand?

432

00:25:19,000 --> 00:25:20,000

Right.

433

00:25:20,000 --> 00:25:22,000

So that's an interesting question.

434

00:25:22,000 --> 00:25:26,000

If we pull it back too far and it swings far out, it's going to pull the crane over.

435

00:25:26,000 --> 00:25:29,000

Probably the big question is, how far do we pull it back?

436

00:25:29,000 --> 00:25:30,000

To answer that...

437

00:25:30,000 --> 00:25:33,000

I can go 40 foot radius.

438

00:25:33,000 --> 00:25:34,000

Okay.

439

00:25:34,000 --> 00:25:35,000

So let's talk this through.

440

00:25:35,000 --> 00:25:36,000

That's 40.

441

00:25:36,000 --> 00:25:40,000

The guys look into the limits of the crane's live load capacity.

442

00:25:40,000 --> 00:25:44,000

Let's say the ball hangs here and the crane is here in relation to the house.

443

00:25:44,000 --> 00:25:46,000

Discuss the physics involved.

444

00:25:46,000 --> 00:25:48,000

Four sequels, mass times acceleration.

445

00:25:48,000 --> 00:25:53,000

So once that ball starts to move, it wants to keep going.

446

00:25:53,000 --> 00:25:55,000

Nooo!

447

00:25:55,000 --> 00:25:59,000

And after an hour of tense discussion.

448

00:25:59,000 --> 00:26:01,000

Really, you have no intuition about that whatsoever?

449

00:26:01,000 --> 00:26:04,000

Come up with a swing distance of...

450

00:26:04,000 --> 00:26:06,000

What if we did 12 feet?

451

00:26:06,000 --> 00:26:12,000

12 feet is significantly less than the freewheeling cartoon capers of Springfield.

452

00:26:12,000 --> 00:26:13,000

Good.

453

00:26:13,000 --> 00:26:17,000

But it's as far as the real world physics allowed.

454

00:26:17,000 --> 00:26:19,000

All right, you like that?

455

00:26:19,000 --> 00:26:20,000

Yeah, I think that's perfect.

456

00:26:20,000 --> 00:26:24,000

And with those parameters in place, the guys set up for the control.

457

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

Extending now.

458

00:26:27,000 --> 00:26:33,000

You may be wondering why we're not pulling our wrecking ball back quite as far as you see them do in the Simpsons.

459

00:26:33,000 --> 00:26:35,000

About four feet away.

460

00:26:35,000 --> 00:26:40,000

Well, cranes aren't designed to swing heavy weights around like tether balls.

461

00:26:40,000 --> 00:26:44,000

If they did that in a heartbeat, they could tip the whole crane right over.

462

00:26:44,000 --> 00:26:45,000

Stop.

463

00:26:45,000 --> 00:26:46,000

Stop.

464

00:26:46,000 --> 00:26:48,000

Are you happy with that?

465

00:26:48,000 --> 00:26:49,000

You betcha.

466

00:26:49,000 --> 00:26:50,000

In rigging, there are two kinds of loads.

467

00:26:50,000 --> 00:26:52,000

A dead load and a live load.

468

00:26:52,000 --> 00:26:57,000

A live load is one that moves and this load is about as live as it gets.

469

00:26:57,000 --> 00:27:02,000

The repercussions of a miscalculation could be catastrophic.

470

00:27:02,000 --> 00:27:08,000

It's just like destruction and potential.

471

00:27:08,000 --> 00:27:15,000

But the question they're aiming to answer is what kind of hit will the house take without Homer?

472

00:27:15,000 --> 00:27:17,000

This is Simpsons.

473

00:27:17,000 --> 00:27:20,000

Wrecking ball control minus Homer.

474

00:27:20,000 --> 00:27:24,000

In three, two, one, go.

475

00:27:37,000 --> 00:27:39,000

Yeah!

476

00:27:41,000 --> 00:27:43,000

Oh, fabulous.

477

00:27:43,000 --> 00:27:45,000

Second hit.

478

00:27:46,000 --> 00:27:48,000

Oh, yeah.

479

00:27:48,000 --> 00:27:51,000

Third hit. Let's go for third hit.

480

00:27:51,000 --> 00:27:56,000

The whole building just is kind of shifting.

481

00:27:56,000 --> 00:28:09,000

Our test showed that a wrecking ball hitting a house like this would severely damage any masonry as well as the framing and the wall of the house.

482

00:28:09,000 --> 00:28:11,000

Just like it did here.

483

00:28:11,000 --> 00:28:18,000

Now the question is, will Homer make any difference if he gets in between that ball and the house?

484

00:28:18,000 --> 00:28:20,000

Honestly, I don't know.

485

00:28:25,000 --> 00:28:37,000

To find out if Bart's Bellagio-esque fountain will translate from the success in small scale to full scale, the myth crackers hit the bomb range.

486

00:28:37,000 --> 00:28:41,000

After having played with miniature toilets to our hearts' content, go.

487

00:28:44,000 --> 00:28:50,000

We're going to assemble three real toilets on a platform seven feet off the ground with a real full scale plumbing system.

488

00:28:50,000 --> 00:28:52,000

Ready to get started and build this thing?

489

00:28:52,000 --> 00:28:53,000

Can you give me a minute?

490

00:28:53,000 --> 00:28:54,000

Sure.

491

00:28:54,000 --> 00:28:59,000

So that we can cherry bomb it all day long and believe me, we will.

492

00:29:01,000 --> 00:29:03,000

Yeah! Come on.

493

00:29:03,000 --> 00:29:06,000

One toilet, two toilets, three toilets.

494

00:29:06,000 --> 00:29:10,000

To recreate the exact same setup as the shop test.

495

00:29:12,000 --> 00:29:16,000

Remember kids, proper care of your toilet requires brushing twice a day.

496

00:29:16,000 --> 00:29:19,000

But as a standard size sewage system...

497

00:29:23,000 --> 00:29:24,000

It's almost like Godzilla.

498

00:29:24,000 --> 00:29:27,000

The guys plumb the multiple inputs.

499

00:29:30,000 --> 00:29:32,000

Yes, that's it.

500

00:29:32,000 --> 00:29:36,000

A gas vent and central waste pipe to a seven foot high platform.

501

00:29:41,000 --> 00:29:43,000

Maybe we should just back away a little bit.

502

00:29:43,000 --> 00:29:47,000

And up top, Adam finishes with three fully functional toilets.

503

00:29:47,000 --> 00:29:50,000

Hey! That totally worked!

504

00:29:52,000 --> 00:29:58,000

Now, what about the boom that shakes the restroom under strict bomb squad supervision?

505

00:29:58,000 --> 00:30:05,000

The guys are using their own mythbusters made cherry bombs to find out if the fuse will fizzle when wet.

506

00:30:05,000 --> 00:30:10,000

Now when you hear that Bart throws a cherry bomb into the toilet, let's get to safety, shall we?

507

00:30:10,000 --> 00:30:11,000

Come on.

508

00:30:11,000 --> 00:30:17,000

Your mind might be set to thinking, I wonder if water would actually put out a cherry bomb's fuse?

509

00:30:17,000 --> 00:30:21,000

An excellent question and one I am just about to answer.

510

00:30:21,000 --> 00:30:24,000

Can't get over how much like a cherry they look.

511

00:30:25,000 --> 00:30:27,000

Here we go, it's about to go under water.

512

00:30:29,000 --> 00:30:31,000

Oh, it's burning under water.

513

00:30:33,000 --> 00:30:35,000

I don't get it.

514

00:30:35,000 --> 00:30:39,000

So how is it that the fuse on Bart's cherry bomb is able to burn under water?

515

00:30:39,000 --> 00:30:41,000

Well, to burn something you need three things.

516

00:30:41,000 --> 00:30:45,000

You need fuel, you need oxygen, and you need a source of ignition.

517

00:30:45,000 --> 00:30:51,000

Now as it happens, the gunpowder that runs along inside this fuse has everything it needs to burn.

518

00:30:51,000 --> 00:30:54,000

It has its own fuel and its own oxidizer.

519

00:30:54,000 --> 00:30:59,000

So it's quite happy to burn without any kind of exterior source of oxygen.

520

00:30:59,000 --> 00:31:03,000

Every time I learn something new it pushes some old stuff out of my brain.

521

00:31:04,000 --> 00:31:08,000

Oh, nice.

522

00:31:09,000 --> 00:31:11,000

That was awesome.

523

00:31:13,000 --> 00:31:19,000

With the fuse firing just fine and the cherry bomb packing a punch, got it.

524

00:31:19,000 --> 00:31:23,000

It's time to fill up and bring the boom.

525

00:31:24,000 --> 00:31:26,000

Okay, that's it.

526

00:31:26,000 --> 00:31:29,000

Our first cherry bomb experiment with the full-size toilet system

527

00:31:29,000 --> 00:31:34,000

is going to replicate the circumstances that we found to be our ideal circumstances in the small scale.

528

00:31:34,000 --> 00:31:39,000

That is the sewer system clogged with water with the cherry bomb placed under that water.

529

00:31:40,000 --> 00:31:41,000

Right about here.

530

00:31:41,000 --> 00:31:46,000

Now we're going to be lighting this off with an electric spark via these wires

531

00:31:46,000 --> 00:31:49,000

because that'll allow us to place this exactly where we want

532

00:31:49,000 --> 00:31:53,000

and set it off exactly when we want from a safe distance.

533

00:31:53,000 --> 00:31:55,000

Okay, we're all sealed up.

534

00:31:56,000 --> 00:31:59,000

Setting off explosives in the air as opposed to water is really quite different

535

00:31:59,000 --> 00:32:03,000

and that's because air compresses and water does not.

536

00:32:03,000 --> 00:32:09,000

So if you apply pressure to water, it'll deliver a shock wave directly to whatever it's connected to.

537

00:32:09,000 --> 00:32:11,000

Kind of like a hammer blow.

538

00:32:13,000 --> 00:32:14,000

Are you ready?

539

00:32:14,000 --> 00:32:15,000

I'm ready. High-speed's ready.

540

00:32:15,000 --> 00:32:18,000

Now in our case, that water hammer can become massive.

541

00:32:18,000 --> 00:32:19,000

And three.

542

00:32:19,000 --> 00:32:22,000

And it'll deliver the shock wave through the water, through the plumbing.

543

00:32:22,000 --> 00:32:23,000

Two.

544

00:32:23,000 --> 00:32:25,000

To anything that it's connected to.

545

00:32:25,000 --> 00:32:26,000

One.

546

00:32:43,000 --> 00:32:44,000

That was catastrophic.

547

00:32:44,000 --> 00:32:45,000

Yeah.

548

00:32:50,000 --> 00:32:53,000

Yep, Jamie's hammer theory nailed it.

549

00:32:53,000 --> 00:32:57,000

In contrast to the shop tests, Simpsons like water fountain.

550

00:32:58,000 --> 00:32:59,000

Oh, yes.

551

00:32:59,000 --> 00:33:01,000

Hey, this camera's still rolling here.

552

00:33:02,000 --> 00:33:06,000

When faced with the same firepower as a real cherry bomb.

553

00:33:06,000 --> 00:33:08,000

It is a freaking horror show up here.

554

00:33:08,000 --> 00:33:13,000

The standard full-size lavatory fixtures were forced free of their moorings,

555

00:33:13,000 --> 00:33:15,000

leaving the porcelain...

556

00:33:16,000 --> 00:33:19,000

And possibly the myth busted.

557

00:33:19,000 --> 00:33:21,000

Looking carefully at the high-speed footage,

558

00:33:21,000 --> 00:33:24,000

you'll notice that water starts coming out beneath the toilets

559

00:33:24,000 --> 00:33:26,000

at the same time as it starts coming out the bowls.

560

00:33:26,000 --> 00:33:29,000

Now that means that that water was moving so fast

561

00:33:29,000 --> 00:33:34,000

that the toilets plumbing was not able to absorb the onrush,

562

00:33:34,000 --> 00:33:37,000

which is why it broke the toilets off their mounts

563

00:33:37,000 --> 00:33:39,000

instead of creating three large geysers.

564

00:33:39,000 --> 00:33:45,000

Our cherry bomb gave us a stunning explosion.

565

00:33:45,000 --> 00:33:49,000

Unfortunately, it also happened to rip all three of our toilets

566

00:33:49,000 --> 00:33:51,000

right out of the floor.

567

00:33:55,000 --> 00:33:56,000

That pretty good?

568

00:33:56,000 --> 00:33:57,000

Looks good to me.

569

00:33:57,000 --> 00:34:01,000

So we have gone to the measure of bolting them right to the cast iron flangers

570

00:34:01,000 --> 00:34:03,000

of the plumbing that they are plumbed to,

571

00:34:03,000 --> 00:34:06,000

and that should hold them tight for this test.

572

00:34:07,000 --> 00:34:10,000

After a quick reset up top...

573

00:34:10,000 --> 00:34:12,000

You know, all evidence to the contrary,

574

00:34:12,000 --> 00:34:15,000

I think you and I would make a good pair of plumbers.

575

00:34:15,000 --> 00:34:18,000

This time, they placed the cherry bomb

576

00:34:18,000 --> 00:34:21,000

at the lowest possible point of the plumbing.

577

00:34:21,000 --> 00:34:25,000

The geyser hoping the larger volume of water above the explosive

578

00:34:25,000 --> 00:34:30,000

will absorb more energy and give them the mythical gushing geysers.

579

00:34:30,000 --> 00:34:31,000

This is it.

580

00:34:31,000 --> 00:34:33,000

After small-scale and large-scale experiments,

581

00:34:33,000 --> 00:34:35,000

this is the blast we hope will work.

582

00:34:35,000 --> 00:34:37,000

We have changed the position of the bomb.

583

00:34:37,000 --> 00:34:39,000

Hell, we've even bolted them to their own plumbing,

584

00:34:39,000 --> 00:34:41,000

which is totally unrealistic,

585

00:34:41,000 --> 00:34:44,000

but it's what we hope it will take to give us the geysers that we're looking for.

586

00:34:44,000 --> 00:34:46,000

And it's just about to happen.

587

00:34:46,000 --> 00:34:47,000

Are you ready, sir?

588

00:34:47,000 --> 00:34:48,000

I am.

589

00:34:48,000 --> 00:34:49,000

Okay.

590

00:34:49,000 --> 00:34:58,000

Five, four, three, two, one, go!

591

00:34:58,000 --> 00:35:05,000

No force can contain the cherry bomb!

592

00:35:10,000 --> 00:35:14,000

What are you gonna do?

593

00:35:14,000 --> 00:35:17,000

Yep, the power was simply too much.

594

00:35:17,000 --> 00:35:21,000

The pressure blast couldn't escape through the narrow plumbing fast enough,

595

00:35:21,000 --> 00:35:23,000

and something had to give.

596

00:35:23,000 --> 00:35:27,000

What we're seeing is that if you have enough energy to push a lot of gas,

597

00:35:27,000 --> 00:35:30,000

you have enough energy to push a lot of water up and out of those toilets

598

00:35:30,000 --> 00:35:32,000

using something like our cherry bomb,

599

00:35:32,000 --> 00:35:36,000

that same energy and the shockwave that accompanies it

600

00:35:36,000 --> 00:35:40,000

is also going to break the toilets off at their bases.

601

00:35:40,000 --> 00:35:43,000

They're simply not strong enough to stay in place.

602

00:35:43,000 --> 00:35:47,000

So, as far as I'm concerned, using an explosive,

603

00:35:47,000 --> 00:35:51,000

you're never gonna see the kind of geyser that we saw in the cartoon.

604

00:35:51,000 --> 00:35:54,000

In this house, we obey the laws of thermodynamics!

605

00:35:54,000 --> 00:35:57,000

The cartoons don't reflect reality?

606

00:35:57,000 --> 00:35:59,000

Wow, this is big.

607

00:35:59,000 --> 00:36:01,000

This is the word busted.

608

00:36:01,000 --> 00:36:02,000

It's busted.

609

00:36:02,000 --> 00:36:03,000

Yes.

610

00:36:03,000 --> 00:36:05,000

Yeah!

611

00:36:05,000 --> 00:36:10,000

Kicking toilets apart since 1930.

612

00:36:10,000 --> 00:36:13,000

They have some steel tip shoes.

613

00:36:13,000 --> 00:36:17,000

With the porcelain pummeled,

614

00:36:17,000 --> 00:36:20,000

Adam and Jamie head back to Homer's house

615

00:36:20,000 --> 00:36:24,000

where our humble hero awaits his moment of glory.

616

00:36:24,000 --> 00:36:25,000

Go!

617

00:36:28,000 --> 00:36:29,000

Hello, friends.

618

00:36:29,000 --> 00:36:31,000

If you're like most people, you probably are sad

619

00:36:31,000 --> 00:36:34,000

that you haven't been able to afford your slice of the American dream,

620

00:36:34,000 --> 00:36:37,000

but now it turns out that you can.

621

00:36:39,000 --> 00:36:42,000

On the outskirts of Springfield, a new development has arisen,

622

00:36:42,000 --> 00:36:44,000

one that provides picture-perfect homes.

623

00:36:44,000 --> 00:36:46,000

If viewed from the right angle,

624

00:36:46,000 --> 00:36:49,000

we've reduced home ownership to its barest essentials.

625

00:36:49,000 --> 00:36:52,000

One wall, one couch, one floor.

626

00:36:52,000 --> 00:36:54,000

Welcome to Shady Acres.

627

00:36:54,000 --> 00:36:56,000

Hey, no attention to the record wall.

628

00:37:05,000 --> 00:37:08,000

Jamie and Adam are chasing a cartoon conundrum.

629

00:37:08,000 --> 00:37:09,000

Oh!

630

00:37:10,000 --> 00:37:11,000

That's his home.

631

00:37:11,000 --> 00:37:13,000

It's a Homer record.

632

00:37:14,000 --> 00:37:19,000

Can our hero's leap of faith dissipate the force of this impact?

633

00:37:23,000 --> 00:37:24,000

Yeah!

634

00:37:24,000 --> 00:37:26,000

You know, it didn't move very fast,

635

00:37:26,000 --> 00:37:29,000

but it had quite a kick to it, didn't it?

636

00:37:29,000 --> 00:37:32,000

I think that's Newton's second wall right there.

637

00:37:34,000 --> 00:37:38,000

Now, we're going to leave all this damage intact as it is.

638

00:37:38,000 --> 00:37:40,000

Aw, couldn't be better.

639

00:37:40,000 --> 00:37:43,000

And go ahead and do the test with Homer on the wrecking ball

640

00:37:43,000 --> 00:37:45,000

with the identical house.

641

00:37:45,000 --> 00:37:48,000

Now, that is a proper cartoon wrecking ball.

642

00:37:48,000 --> 00:37:52,000

And if it shows damage anything like this,

643

00:37:53,000 --> 00:37:57,000

we will know that Homer's efforts would have been for naught.

644

00:37:58,000 --> 00:38:00,000

And ta-da!

645

00:38:00,000 --> 00:38:03,000

Allow me to introduce you to the completed,

646

00:38:03,000 --> 00:38:05,000

ready-to-be-tested with hero's.

647

00:38:05,000 --> 00:38:09,000

The completed, ready-to-be-tested with hero of this episode,

648

00:38:09,000 --> 00:38:11,000

Mr. Homer J. Simpson.

649

00:38:11,000 --> 00:38:14,000

Ladies and gentlemen, let's give a round of applause.

650

00:38:16,000 --> 00:38:19,000

Our accurately sized and dressed Homer

651

00:38:19,000 --> 00:38:23,000

is attached to the ball exactly as per the clip.

652

00:38:23,000 --> 00:38:25,000

That's it. First arm is on. Okay.

653

00:38:25,000 --> 00:38:28,000

With a final, crucial component.

654

00:38:28,000 --> 00:38:34,000

Since part of this is what happens with Homer's body mass on the ball,

655

00:38:34,000 --> 00:38:37,000

we need to give him some body mass other than just foam.

656

00:38:37,000 --> 00:38:40,000

We're doing that by adding water.

657

00:38:40,000 --> 00:38:42,000

The average density of a human body

658

00:38:42,000 --> 00:38:45,000

is within a couple of percentage points of water.

659

00:38:45,000 --> 00:38:46,000

Perfect.

660

00:38:46,000 --> 00:38:51,000

So a water-filled Homer is an almost perfect energy absorption analog

661

00:38:51,000 --> 00:38:54,000

for a real person of that size and shape.

662

00:38:54,000 --> 00:38:57,000

Oh, oh, Homer is substantial.

663

00:38:57,000 --> 00:39:00,000

Our cartoon character is coming to life.

664

00:39:00,000 --> 00:39:04,000

The question is, with a real-life mass of 239 pounds,

665

00:39:04,000 --> 00:39:06,000

can he save his house?

666

00:39:06,000 --> 00:39:08,000

I think we're good to go up.

667

00:39:08,000 --> 00:39:09,000

All right.

668

00:39:09,000 --> 00:39:11,000

It's happening.

669

00:39:13,000 --> 00:39:16,000

We're making sure that we're positioning the ball

670

00:39:16,000 --> 00:39:20,000

exactly the same way that we did the first time.

671

00:39:20,000 --> 00:39:24,000

We'll let it settle, so the physics should all be the same,

672

00:39:24,000 --> 00:39:26,000

except for Homer.

673

00:39:26,000 --> 00:39:29,000

Does it look like his ass is dead center?

674

00:39:29,000 --> 00:39:33,000

He couldn't be more perfectly on the horizon of the lines of force

675

00:39:33,000 --> 00:39:35,000

between the ball and his house.

676

00:39:38,000 --> 00:39:40,000

Look at the potential.

677

00:39:40,000 --> 00:39:42,000

The potential energy.

678

00:39:42,000 --> 00:39:44,000

As per the control, the velocity on impact

679

00:39:44,000 --> 00:39:48,000

may only be a pedestrian six miles an hour.

680

00:39:50,000 --> 00:39:52,000

What are we doing?

681

00:39:52,000 --> 00:39:55,000

But with 5,000 pounds of ball...

682

00:39:55,000 --> 00:39:57,000

Who's paying for this?

683

00:39:57,000 --> 00:39:58,000

This is awesome.

684

00:39:58,000 --> 00:40:01,000

There's a lot of energy to dissipate.

685

00:40:02,000 --> 00:40:04,000

Say goodbye, Homer.

686

00:40:04,000 --> 00:40:08,000

Can our hefty hero really absorb that impact?

687

00:40:08,000 --> 00:40:10,000

All right. Here we go.

688

00:40:10,000 --> 00:40:13,000

Homer versus the wrecking ball.

689

00:40:13,000 --> 00:40:15,000

The final experiment.

690

00:40:15,000 --> 00:40:19,000

Three, two, one.

691

00:40:19,000 --> 00:40:21,000

Here we go.

692

00:40:21,000 --> 00:40:25,000

Oh, oh, oh.

693

00:40:25,000 --> 00:40:29,000

That's a result that I never would have bet on.

694

00:40:29,000 --> 00:40:32,000

He's clearly made a big difference.

695

00:40:32,000 --> 00:40:35,000

Yeah, I mean, look at this house, and look at that one.

696

00:40:35,000 --> 00:40:37,000

Wow.

697

00:40:37,000 --> 00:40:39,000

I'm just saying.

698

00:40:39,000 --> 00:40:42,000

Homer's ass is quite impressive, actually.

699

00:40:51,000 --> 00:40:53,000

It's an astonishing result.

700

00:40:53,000 --> 00:40:56,000

The house didn't escape completely unscathed,

701

00:40:56,000 --> 00:40:58,000

but Homer did help.

702

00:41:01,000 --> 00:41:03,000

He did crack the chimney.

703

00:41:03,000 --> 00:41:06,000

It almost fell, but the fact is that it didn't,

704

00:41:06,000 --> 00:41:08,000

and that's a result.

705

00:41:08,000 --> 00:41:11,000

Well, astonishingly, it turns out Homer did, in fact,

706

00:41:11,000 --> 00:41:13,000

make a difference by placing himself

707

00:41:13,000 --> 00:41:15,000

between the wrecking ball and his house.

708

00:41:15,000 --> 00:41:19,000

He clearly made a heroic effort, and it had a heroic outcome.

709

00:41:19,000 --> 00:41:21,000

Those cartoonists don't get enough credit

710

00:41:21,000 --> 00:41:23,000

for proper engineering.

711

00:41:25,000 --> 00:41:28,000

I am too smart. I am too smart.

712

00:41:28,000 --> 00:41:31,000

S-M-R-T. I mean, S-M-A-R-T.

713

00:41:31,000 --> 00:41:34,000

All right, Al, I got some good news and some bad news.

714

00:41:34,000 --> 00:41:36,000

I'm going to start with the bad news,

715

00:41:36,000 --> 00:41:38,000

which is the toilet bomb.

716

00:41:38,000 --> 00:41:42,000

Unfortunately, all we got was total toilet destruction.

717

00:41:42,000 --> 00:41:43,000

It's busted.

718

00:41:43,000 --> 00:41:45,000

Well, you forget that the school is near a nuclear plant.

719

00:41:45,000 --> 00:41:47,000

A nuclear plant run by idiots.

720

00:41:47,000 --> 00:41:50,000

Oh, it's funny, because it's true.

721

00:41:50,000 --> 00:41:52,000

And there could be a nuclear explosion at any moment,

722

00:41:52,000 --> 00:41:55,000

which means that the toilets are ultra-super reinforced,

723

00:41:55,000 --> 00:41:56,000

not busted.

724

00:41:56,000 --> 00:41:57,000

Hmm.

725

00:41:57,000 --> 00:41:59,000

I see where you're headed with that.

726

00:41:59,000 --> 00:42:00,000

Good news?

727

00:42:00,000 --> 00:42:02,000

The good news is Homer wrecker.

728

00:42:02,000 --> 00:42:04,000

We are totally amazed by these results,

729

00:42:04,000 --> 00:42:06,000

but the fact is that Homer made a difference

730

00:42:06,000 --> 00:42:09,000

by placing his body between the wrecking ball and his house.

731

00:42:09,000 --> 00:42:12,000

He was successfully able to keep it from being damaged.

732

00:42:12,000 --> 00:42:16,000

So you're saying the show is 100% scientifically accurate.

733

00:42:16,000 --> 00:42:19,000

Sure.

734

00:42:19,000 --> 00:42:22,000

Thank you, gentlemen.