

1

00:00:00,000 --> 00:00:29,800

The Earth, home to millions of species.

2

00:00:29,800 --> 00:00:45,400

But what might live beyond?

3

00:00:45,400 --> 00:00:54,160

There are countless planets throughout the universe.

4

00:00:54,160 --> 00:01:13,320

If life exists on only a fraction of them, then the universe must be alive.

5

00:01:13,320 --> 00:01:38,280

All living things have the same needs to feed, reproduce and evolve.

6

00:01:38,280 --> 00:01:47,480

By applying the laws of life on Earth to the rest of the universe, it's possible to imagine

7

00:01:47,480 --> 00:01:52,360

what could live on alien worlds.

8

00:02:08,280 --> 00:02:28,880

All life forms need a planet to live on. But how many planets are there in the universe?

9

00:02:28,880 --> 00:02:41,680

Think about our star, the sun, with Earth, Mars, Jupiter orbiting it.

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00:02:41,680 --> 00:02:46,480

For centuries, people have asked themselves, what about the other stars?

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00:02:46,480 --> 00:02:52,080

Do they have planets as well?

12

00:02:52,080 --> 00:03:02,880

And 24 years ago, I found one.

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00:03:02,880 --> 00:03:09,120

Didier Quellos is a superstar astrophysicist.

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00:03:09,120 --> 00:03:18,560

He has won the Nobel Prize for discovering the first planet beyond our solar system.

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00:03:18,640 --> 00:03:22,320

I was 28 years old when I found the planet.

16

00:03:22,320 --> 00:03:28,720

I was about to finish my PhD and my PhD advisor gave me the key of the equipment.

17

00:03:28,720 --> 00:03:36,720

And after observing a couple of times, the star Fifty One Peg, I realized that something was going on on that star.

18

00:03:36,720 --> 00:03:40,160

And frankly, I just panicked at that time.

19

00:03:40,160 --> 00:03:44,320

I thought something was really wrong with my equipment.

20

00:03:44,320 --> 00:03:49,680

And the more I wanted to understand this, the least it made sense.

21

00:03:49,680 --> 00:03:58,320

Until the point I got convinced, it must be a planet.

22

00:03:58,320 --> 00:04:02,400

That's likely to be a planet over there.

23

00:04:02,400 --> 00:04:12,000

Could be Jupiter over there. It's pretty cool.

24

00:04:12,080 --> 00:04:21,120

Distant planets are invisible to telescopes because they don't emit any light.

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00:04:21,120 --> 00:04:27,520

But if a planet passes in front of a star, it casts a tiny shadow.

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00:04:27,520 --> 00:04:32,880

And there's a minuscule dimming of the star's brightness.

27

00:04:32,880 --> 00:04:41,840

When astronomers detect this dip in light level, they have found a new planet.

28

00:04:41,840 --> 00:04:46,160

Hello guys. Here is what the telescope is looking at.

29

00:04:46,160 --> 00:04:49,280

This is a picture of the telescope right now.

30

00:04:49,280 --> 00:04:52,720

In the middle you have the target we are observing.

31

00:04:52,720 --> 00:05:00,640

So you analyze this whole field, you process the data, and if you're lucky enough, you detect this.

32

00:05:00,640 --> 00:05:03,280

It's a little bit of a decrease of the flux.

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00:05:03,280 --> 00:05:10,960

And this tells me that there is a planet orbiting that star.

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00:05:10,960 --> 00:05:17,760

We know there are a huge number of planets in the universe.

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00:05:17,760 --> 00:05:22,400

There must be zillions of different lives.

36

00:05:22,400 --> 00:05:27,040

Let's imagine that this is the Earth here.

37

00:05:27,040 --> 00:05:33,760

Right? So imagine that one meter is 20 light years.

38

00:05:33,760 --> 00:05:43,920

So I make two meters is 40 light years. This is where you have 51 pegs, where the first planet was detected.

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00:05:43,920 --> 00:05:51,360

Each of these tiny lights represents a star where a planet has been found.

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00:05:51,360 --> 00:05:56,160

Over the next few years, planets were turning out everywhere.

41

00:05:56,160 --> 00:06:03,520

Planet, planet, everywhere.

42

00:06:03,520 --> 00:06:06,240

It looks pretty cool right now.

43

00:06:06,240 --> 00:06:11,680

Horizon of star on planet. All around.

44

00:06:12,480 --> 00:06:24,000

Planets beyond our solar system are called exoplanets.

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00:06:24,000 --> 00:06:38,000

Astronomers have found over 4,000 of them, and they keep finding more.

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00:06:38,800 --> 00:06:48,320

They now believe there's at least one planet for every star in the universe.

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00:06:48,320 --> 00:06:58,320

That means over a million, billion, trillion exoplanets.

48

00:06:58,320 --> 00:07:04,320

More than all the grains of sand on Earth.

49

00:07:04,640 --> 00:07:12,640

A vast canvas for the evolution of life.

50

00:07:16,640 --> 00:07:20,640

The distances are mind-boggling.

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00:07:20,640 --> 00:07:28,640

The nearest exoplanets are trillions of miles from us.

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00:07:29,600 --> 00:07:37,120

But they're all subject to the same force that holds the Earth in place.

53

00:07:37,120 --> 00:07:41,120

Gravity.

54

00:07:46,080 --> 00:07:55,120

Imagine a world double the size of Earth with twice as much gravity.

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00:07:56,000 --> 00:07:59,600

This is Atlas.

56

00:08:03,200 --> 00:08:07,600

How would life adapt on such a world?

57

00:08:17,920 --> 00:08:23,600

Gravity pulls vegetation to the planet's surface.

58

00:08:24,160 --> 00:08:29,440

And yet, seeds can float in the sky.

59

00:08:29,440 --> 00:08:33,120

That's because gravity here is so strong.

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00:08:33,120 --> 00:08:38,240

Air molecules are densely packed together,

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00:08:38,240 --> 00:08:46,240

creating a thick buoyant atmosphere for seeds to drift through.

62

00:08:53,600 --> 00:09:02,240

And where there are seeds, there are sky-grazes.

63

00:09:03,200 --> 00:09:16,240

Giant herbivores with six wings to ride on the dense pillow of air.

64

00:09:16,240 --> 00:09:26,240

Because of the extra gravity, they weigh twice as much as they would on Earth.

65

00:09:28,240 --> 00:09:32,240

But they don't fall from the sky.

66

00:09:32,240 --> 00:09:38,240

The atmosphere is thick enough to keep them airborne.

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00:09:38,240 --> 00:09:54,240

Whether on Atlas or on Earth, flying is always a battle to overcome gravity.

68

00:09:58,240 --> 00:10:04,240

You might say you have a pretty complicated relationship with gravity.

69

00:10:04,640 --> 00:10:10,240

And you can really feel that gravity is a force pulling you down as you struggle your way up.

70

00:10:11,920 --> 00:10:16,240

But ultimately, my dream has always been to be able to fly.

71

00:10:23,520 --> 00:10:28,000

The thing I love most about paragliding is that it's so simple and intuitive.

72

00:10:28,000 --> 00:10:32,240

It's just you and the air.

73

00:10:32,240 --> 00:10:40,240

Like the sky-grazes on Atlas, paragliders use their wings to generate lift.

74

00:10:42,240 --> 00:10:46,240

But the atmosphere is less dense on Earth.

75

00:10:46,240 --> 00:10:52,240

So it takes more effort to stay airborne.

76

00:10:54,240 --> 00:10:58,240

Most people don't see air as a substance.

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00:10:58,240 --> 00:11:06,240

But for me, when I'm flying, I really see it as a fluid that's moving up and down the valleys and along the ridges.

78

00:11:08,240 --> 00:11:12,240

It would be really weird to fly in a very dense atmosphere.

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00:11:12,240 --> 00:11:18,240

You could just be gliding around the whole time effortlessly.

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00:11:20,240 --> 00:11:26,240

The best way to gain altitude is to find an updraft known as a thermal.

81

00:11:29,040 --> 00:11:34,240

When you hit the thermal, it's very similar to when you're in an elevator and it starts.

82

00:11:36,240 --> 00:11:40,240

You feel the push upwards.

83

00:11:44,240 --> 00:11:48,240

Just the power of nature to pull me up.

84

00:11:50,240 --> 00:11:56,240

When I'm flying and I see a bird circling up, it means there must be a thermal there.

85

00:11:56,240 --> 00:12:00,240

We're always constantly looking at them.

86

00:12:02,240 --> 00:12:08,240

You can really feel the balance between the gravity pulling you down and the air lifting you up.

87

00:12:08,240 --> 00:12:16,240

You can then use your body weight to gain speed and use that speed to generate more energy and feel that you're moving through the air.

88

00:12:26,240 --> 00:12:42,240

The gravity may be weaker on Earth than on Atlas, but the thinner atmosphere means there's less buoyancy.

89

00:12:44,240 --> 00:12:48,240

So eventually, everything falls.

90

00:12:56,240 --> 00:13:00,240

The sky is the only way to get there.

91

00:13:10,240 --> 00:13:14,240

On Atlas, the sky grazers never need to land.

92

00:13:18,240 --> 00:13:22,240

Their front and back wings are for direction and thrust.

93

00:13:22,240 --> 00:13:28,240

Their long middle wings are for catching thermals.

94

00:13:32,240 --> 00:13:40,240

Despite their weight, the air is thick enough for them to live a life in the sky.

95

00:13:44,240 --> 00:13:48,240

But it's not always a peaceful life.

96

00:13:48,240 --> 00:13:54,240

As on Earth, grazers attract predators.

97

00:13:56,240 --> 00:14:04,240

Using hydrogen-producing bacteria to inflate their air sacs, they take to the skies.

98

00:14:04,240 --> 00:14:08,240

Alone, there's no match for their prey.

99

00:14:12,240 --> 00:14:20,240

So they hunt in a pack, waiting for a sky grazer to stray from the group.

100

00:14:34,240 --> 00:14:46,240

Target sighted. They expel their gas and attack from above.

101

00:14:56,240 --> 00:15:00,240

The fastest predator on Earth uses the same tactic.

102

00:15:04,240 --> 00:15:12,240

My interest in flying falcons is their predatory instinct coupled with the speed factor.

103

00:15:16,240 --> 00:15:20,240

And how they use that speed to their advantage.

104

00:15:24,240 --> 00:15:32,240

But just watching a top predator do its thing is perfection.

105

00:15:34,240 --> 00:15:50,240

I probably have 30-some birds at this moment. Each bird is a different personality.

106

00:15:50,240 --> 00:15:56,240

What I love about falcons is how evolution has made the most perfect specimen.

107

00:16:04,240 --> 00:16:10,240

I do have a relationship with these guys. Certainly from my end I do.

108

00:16:10,240 --> 00:16:16,240

I don't think the falcons see it that way, but they certainly see me as part of the team.

109

00:16:16,240 --> 00:16:24,240

Vahe Alavurdian trains captive bred falcons how to hunt.

110

00:16:27,240 --> 00:16:33,240

These birds are already genetically programmed to be the top-notch avian predators that they are.

111

00:16:34,240 --> 00:16:38,240

What we do as falconers is to try to awaken that predatory nature in the bird.

112

00:16:47,240 --> 00:16:49,240

Lure training is the very first step.

113

00:16:54,240 --> 00:17:00,240

I want to put that lure in front of the bird and get the falcon to coordinate eye to foot

114

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

and throw its feet out as if it's going to grab it.

115

00:17:03,240 --> 00:17:10,240

As that happens I try to pull that away from the falcon to get it to shoot up in the air and repeat this process again.

116

00:17:10,240 --> 00:17:15,240

I want to see that bird drop down as vertical as it can.

117

00:17:18,240 --> 00:17:22,240

That's something that they later on will apply to hunting game.

118

00:17:30,240 --> 00:17:38,240

When the falcons are ready, Vahe introduces a prey target, a racing pigeon.

119

00:17:41,240 --> 00:17:49,240

The falcon can't keep up with the pigeon in a chase, so its best bet is to drop on it using gravity.

120

00:17:49,240 --> 00:18:01,240

When the bird thinks that he's got the advantage, that's when the wings will get tucked in.

121

00:18:04,240 --> 00:18:10,240

They stoop into a little teardrop shape coming down from the heavens.

122

00:18:11,240 --> 00:18:19,240

The kinetic energy of a falcon hitting a pigeon would be as if you were hit by a cannon ball.

123

00:18:26,240 --> 00:18:35,240

In training, the pigeon invariably gets away because the falcon is made to stoop from less than a thousand feet.

124

00:18:35,240 --> 00:18:45,240

When hunting for real, it'll drop from a greater height to lethal effect.

125

00:19:06,240 --> 00:19:09,240

The predators make their move.

126

00:19:23,240 --> 00:19:27,240

They deploy their wings to create drag,

127

00:19:28,240 --> 00:19:34,240

destabilizing the sky grazer to devour it on the ground.

128

00:19:36,240 --> 00:19:42,240

The falcon is too small to take down such a large beast.

129

00:19:51,240 --> 00:19:55,240

Today, they'll go hungry.

130

00:20:06,240 --> 00:20:13,240

The sky grazer climbs to a safe height to recuperate.

131

00:20:18,240 --> 00:20:23,240

But as a fertile female, she has company.

132

00:20:24,240 --> 00:20:29,240

Male grazers competing to be chosen as a mate.

133

00:20:36,240 --> 00:20:42,240

Their oversized tails are a handicap, making it harder to fly.

134

00:20:43,240 --> 00:20:47,240

But to the female, they're a sign of vitality.

135

00:20:51,240 --> 00:20:57,240

The first to reach her gets to mate and pass on his genes.

136

00:20:58,240 --> 00:21:04,240

The same principle applies on Earth,

137

00:21:05,240 --> 00:21:10,240

whether up in the sky or down in the dirt.

138

00:21:13,240 --> 00:21:18,240

Males compete for the right to mate.

139

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

I think when people sit at home watching insects on top of a tree,

140

00:21:27,240 --> 00:21:32,240

they imagine a cameraman sitting in the jungle in a river or in a hedge

141

00:21:32,240 --> 00:21:36,240

waiting for this beetle to come across and reproduce

142

00:21:36,240 --> 00:21:39,240

or have a fight in front of the camera.

143

00:21:42,240 --> 00:21:44,240

It doesn't work that way.

144

00:21:48,240 --> 00:21:53,240

This is a ramshackle-old shed which is attached to my parents' place,

145

00:21:53,240 --> 00:21:55,240

which is just there.

146

00:21:55,240 --> 00:21:58,240

Huge advantages to having a place attached to your mum and dad's.

147

00:21:58,240 --> 00:22:03,240

You get good dinners in the evening and teas arriving during the day.

148

00:22:03,240 --> 00:22:06,240

Come and have a look and see what we're doing.

149

00:22:06,240 --> 00:22:10,240

Oh, gosh. What an after-day.

150

00:22:10,240 --> 00:22:13,240

They are rhinoceros beetles.

151

00:22:13,240 --> 00:22:16,240

The male's got these big horns. The female doesn't.

152

00:22:16,240 --> 00:22:22,240

It's a form of sexual selection because the females like males with big horns.

153

00:22:24,240 --> 00:22:28,240

So every time they mate, they'll mate with a beetle that has a slightly bigger horn

154

00:22:28,240 --> 00:22:33,240

than the one they last seen before, and therefore that male passes its genes on.

155

00:22:33,240 --> 00:22:37,240

So over generations, the horns will get bigger.

156

00:22:39,240 --> 00:22:40,240

Anywhere particular?

157

00:22:40,240 --> 00:22:43,240

Just on the log facing the other male.

158

00:22:44,240 --> 00:22:46,240

Right, here they go. They're going straight away.

159

00:22:49,240 --> 00:22:52,240

The horns of a male rhinoceros beetle

160

00:22:52,240 --> 00:22:55,240

are like the tail of a male sky grazer.

161

00:22:58,240 --> 00:23:01,240

They've evolved for sexual competition.

162

00:23:02,240 --> 00:23:04,240

Going straight down to the right.

163

00:23:04,240 --> 00:23:07,240

Try and walk the lead.

164

00:23:08,240 --> 00:23:10,240

Yes.

165

00:23:25,240 --> 00:23:30,240

■ massacre.

166

00:23:31,240 --> 00:23:32,240

Yeah.

167

00:23:35,640 --> 00:23:36,800

One, two, three.

168

00:23:38,080 --> 00:23:39,080

Is that all right? Yeah.

169

00:23:41,480 --> 00:23:42,760

Can I put this in? Yes.

170

00:23:48,040 --> 00:23:51,720

Male insects don't always fight to snare a mate.

171

00:23:53,200 --> 00:23:57,200

Sometimes it's enough just to show off their physical prowess.

172

00:23:57,200 --> 00:24:02,200

Right, I'm going to bring the male in front of you.

173

00:24:02,200 --> 00:24:04,200

He's coming in from your right.

174

00:24:06,200 --> 00:24:08,200

Now it's flown off.

175

00:24:09,200 --> 00:24:11,200

These are stalk-eyed flies.

176

00:24:14,200 --> 00:24:17,200

Stalk-eyed fly is an amazing little thing.

177

00:24:17,200 --> 00:24:21,200

It looks a little bit like an ant with massive eyes on the ends of stalks.

178

00:24:22,200 --> 00:24:26,200

Both the male and the female have eyes on the end of stalks,

179

00:24:26,200 --> 00:24:29,200

but the male has much longer eyes stalks than the female.

180

00:24:32,200 --> 00:24:36,200

The males with the long stalks will come up to one another

181

00:24:36,200 --> 00:24:38,200

and they will kind of have a little dance.

182

00:24:44,200 --> 00:24:49,200

And they will try and judge which of the two of them has the biggest stalks.

183

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

There they are. That's the standoff.

184

00:24:57,200 --> 00:25:01,200

The winner of that will remain where they are and the loser will then toddle off.

185

00:25:03,200 --> 00:25:08,200

That winner then will gain access to the female and be able to reproduce with her,

186

00:25:08,200 --> 00:25:11,200

and that way can pass on the genetics that he has,

187

00:25:11,200 --> 00:25:14,200

which will include that of a longer eye stalk.

188

00:25:15,200 --> 00:25:17,200

Yes. Are you on it? Got it.

189

00:25:18,200 --> 00:25:19,200

Oh, it's fantastic.

190

00:25:20,200 --> 00:25:23,200

Normally it's a second and they're gone. This is fantastic.

191

00:25:33,200 --> 00:25:37,200

Why would the male stalk-eyed fly go to the effort of having these enormous eye stalks?

192

00:25:38,200 --> 00:25:41,200

Well, the idea is that you are conspicuously signaling to the female

193

00:25:41,200 --> 00:25:46,200

that you can have this incredible investment of energy into this resource

194

00:25:46,200 --> 00:25:48,200

that is completely needless.

195

00:25:50,200 --> 00:25:54,200

And if you can still survive, if you can carry on flying and living

196

00:25:54,200 --> 00:25:59,200

and not getting predated upon, and still have this wasteful extravagance

197

00:25:59,200 --> 00:26:03,200

coming out of your head, then you're going to be a pretty good bet to reproduce with.

198

00:26:17,200 --> 00:26:24,200

On Atlas, the long tail of the male sky grazer shows his ideal choice.

199

00:26:27,200 --> 00:26:29,200

To father the next generation.

200

00:26:36,200 --> 00:26:39,200

But the mother can't lay her eggs in the sky.

201

00:26:46,200 --> 00:26:48,200

So she's come down to land.

202

00:26:53,200 --> 00:26:58,200

Because of the gravity, she's too heavy to launch herself back into the sky.

203

00:27:04,200 --> 00:27:08,200

To create new life, she must surrender her own.

204

00:27:17,200 --> 00:27:21,200

The babies grow up close to where their mothers died.

205

00:27:24,200 --> 00:27:28,200

Now they need to get off the ground and into the air.

206

00:27:36,200 --> 00:27:39,200

But scavengers lie in wait.

207

00:27:40,200 --> 00:27:45,200

A bone-laying, a body-laying, a body-laying, a body-laying, a body-laying,

208

00:27:45,200 --> 00:27:50,200

boneless creatures with no skeleton to give them form.

209

00:27:55,200 --> 00:28:00,200

They kill by enveloping and dissolving their prey.

210

00:28:00,200 --> 00:28:07,200

The sky grazers have only just hatched, but already they're in grave danger.

211

00:28:11,200 --> 00:28:14,200

And now, there's no going back.

212

00:28:31,200 --> 00:28:34,200

The End

213

00:28:48,200 --> 00:28:55,200

Every day on Earth, young animals have to overcome terrible odds if they're to survive.

214

00:28:56,200 --> 00:29:01,200

60% of meerkats don't make it to their first birthday.

215

00:29:04,200 --> 00:29:09,200

For a young meerkat in their early life, there's a lot of danger here.

216

00:29:10,200 --> 00:29:14,200

They're vulnerable for many months after they're born.

217

00:29:17,200 --> 00:29:21,200

But particularly in the first month or two after they emerge from the burrow.

218

00:29:25,200 --> 00:29:29,200

Predators are everywhere and a constant danger.

219

00:29:34,200 --> 00:29:40,200

There are snakes in this area that will eat a young meerkat.

220

00:29:56,200 --> 00:30:03,200

A young meerkat is safe within a group, but if it lags behind, it's vulnerable.

221

00:30:15,200 --> 00:30:18,200

Scorpions are a constant threat.

222

00:30:19,200 --> 00:30:26,200

The young are really completely incompetent and totally ignorant when it comes to dealing with scorpions initially.

223

00:30:29,200 --> 00:30:32,200

But they can't avoid this danger forever.

224

00:30:33,200 --> 00:30:38,200

They're going to eventually have to learn how to neutralize the threat.

225

00:30:49,200 --> 00:30:55,200

The first time that a young meerkat faces a scorpion and it has to deal with it itself,

226

00:30:56,200 --> 00:30:59,200

is probably a terrifying encounter.

227

00:31:00,200 --> 00:31:03,200

This is a real moment of truth.

228

00:31:18,200 --> 00:31:23,200

It's a real rite of passage because once they've managed to do that themselves,

229

00:31:24,200 --> 00:31:30,200

then they really are at a stage where they can start to forage by themselves and become independent and be a useful group member.

230

00:31:32,200 --> 00:31:39,200

So they've really managed to escape the vulnerability of being a pup and made that transition into being an adult.

231

00:31:40,200 --> 00:31:45,200

It's one step on the road to adulthood, but it's by no means plain sailing after that.

232

00:31:46,200 --> 00:31:51,200

There are a lot of threats out there and it will have to continue to learn.

233

00:31:52,200 --> 00:31:55,200

It's a real moment of truth.

234

00:31:56,200 --> 00:31:59,200

It's a real moment of truth.

235

00:32:00,200 --> 00:32:03,200

It's a real moment of truth.

236

00:32:04,200 --> 00:32:08,200

It's a real moment of truth after all of this.

237

00:32:21,200 --> 00:32:27,200

It doesn't matter how much it's new or how long it lasts but you should be willing to let it grow.

238

00:32:27,200 --> 00:32:29,200

They have no choice.

239

00:32:31,200 --> 00:32:33,200

It's time to fly.

240

00:32:58,200 --> 00:33:00,200

I'm not safe.

241

00:33:03,200 --> 00:33:06,200

Even in the air, they're still not safe.

242

00:33:14,200 --> 00:33:18,200

On Atlas, survival is a game of chance.

243

00:33:27,200 --> 00:33:31,200

Life goes on, from one generation to the next.

244

00:33:34,200 --> 00:33:36,200

At least for now.

245

00:33:41,200 --> 00:33:46,200

The strong gravity of Atlas pulls asteroids onto a collision course.

246

00:33:46,200 --> 00:33:51,200

The Earth is a place where the gravity of the collision is lost.

247

00:33:55,200 --> 00:33:57,200

Most burn up in the atmosphere.

248

00:33:59,200 --> 00:34:03,200

But there's a constant threat something big will get through.

249

00:34:05,200 --> 00:34:08,200

And reset the course of life on the planet.

250

00:34:17,200 --> 00:34:20,200

Because gravity is weaker on Earth than Atlas,

251

00:34:21,200 --> 00:34:24,200

asteroid strikes are less frequent.

252

00:34:26,200 --> 00:34:30,200

But when they do occur, they can be catastrophic.

253

00:34:35,200 --> 00:34:38,200

This is the Yucatan Peninsula.

254

00:34:41,200 --> 00:34:45,200

27,000 square miles of tropical jungle.

255

00:34:47,200 --> 00:34:53,200

But hidden within the jungle are numerous sinkholes called cenotes.

256

00:35:06,200 --> 00:35:11,200

These are entrances to vast underground cave systems.

257

00:35:12,200 --> 00:35:16,200

There's no surface rivers or streams in the peninsula.

258

00:35:16,200 --> 00:35:20,200

So the only source of water is underground in caves.

259

00:35:27,200 --> 00:35:31,200

But the really interesting thing is the location of these cenotes.

260

00:35:31,200 --> 00:35:36,200

Although there's probably 10,000 or more cenotes across the peninsula,

261

00:35:36,200 --> 00:35:40,200

in the northwest corner,

262

00:35:44,200 --> 00:35:48,200

they occur in a very well-defined semicircle.

263

00:35:48,200 --> 00:35:53,200

If we follow that semicircle out into the Gulf of Mexico,

264

00:35:56,200 --> 00:36:01,200

we now have a complete circle that marks what one would expect

265

00:36:01,200 --> 00:36:05,200

from the edge of an asteroid impact crater.

266

00:36:07,200 --> 00:36:13,200

65 million years ago, gravity pulled an asteroid into our solar system.

267

00:36:16,200 --> 00:36:22,200

It smashed into our planet, causing the extinction of 75% of life on Earth.

268

00:36:23,200 --> 00:36:29,200

The asteroid strike generated enough debris to block out sunlight for two years.

269

00:36:34,200 --> 00:36:38,200

A world plunged into darkness.

270

00:36:38,200 --> 00:36:42,200

Nothing could grow.

271

00:36:43,200 --> 00:36:48,200

This would happen on Atlas if a big enough asteroid hit the planet.

272

00:36:49,200 --> 00:36:54,200

Cenotes are difficult places to survive.

273

00:36:54,200 --> 00:36:59,200

Just like the Earth was 65 million years ago.

274

00:37:02,200 --> 00:37:07,200

The Earth is a very large planet.

275

00:37:07,200 --> 00:37:12,200

The Earth was 65 million years ago.

276

00:37:12,200 --> 00:37:17,200

What are the characteristics that a species needs to survive an extinction?

277

00:37:27,200 --> 00:37:31,200

Somebody hid here.

278

00:37:38,200 --> 00:37:43,200

So crocodiles are very resilient animals.

279

00:37:43,200 --> 00:37:48,200

They live both in the water and on land.

280

00:37:48,200 --> 00:37:54,200

They're generalists. They don't require a specific diet.

281

00:37:54,200 --> 00:37:59,200

They'll eat almost anything.

282

00:37:59,200 --> 00:38:04,200

Whatever is available is good enough. They'll take it.

283

00:38:08,200 --> 00:38:15,200

Here in this Cenote, once fallen in, gotten trapped, no way out,

284

00:38:15,200 --> 00:38:21,200

somehow, somehow, it succeeded.

285

00:38:21,200 --> 00:38:26,200

They're survivors.

286

00:38:26,200 --> 00:38:32,200

In a changing world, it pays to be a generalist, not a specialist.

287

00:38:38,200 --> 00:38:45,200

If a big enough asteroid hits Atlas, the sky grazes and predators would be doomed.

288

00:38:53,200 --> 00:38:58,200

They're too specialized to cope with change.

289

00:38:59,200 --> 00:39:04,200

The generalists are the boneless scavengers.

290

00:39:04,200 --> 00:39:11,200

Like crocodiles, they eat anything and live anywhere.

291

00:39:14,200 --> 00:39:21,200

On this imagined high-gravity world, they could be the only ones left.

292

00:39:22,200 --> 00:39:29,200

On this imagined high-gravity world, they could be the great survivors.

293

00:39:42,200 --> 00:39:49,200

How might life adapt on a different world, where creatures are trapped

294

00:39:50,200 --> 00:39:56,200

between a searing desert and a frozen shadow land?

295

00:39:57,200 --> 00:40:02,200

A world of extremes.