



## DINOSAURS. Script Timecode

00:00:11:26 00:00:14:25

[CELESTE] Come on, let's try again.

00:00:17:06 00:00:20:02

[CELESTE] We fold it here...

00:00:20:10 00:00:22:24

[CELESTE] We rotate it.

00:00:23:22 00:00:28:05

[CELESTE] We fold it again and bring the edges together.

00:00:28:17 00:00:31:02

[CELESTE] Wait. No, we fold it...

00:00:31:02 00:00:33:14

[CELESTE] We stick this in the middle.

00:00:33:15 00:00:35:07

[CELESTE] We open it again?

00:00:37:24 00:00:40:18

[CELESTE] That's impossible.

00:00:41:05 00:00:42:24

[CELESTE] Ah...I give up.

00:00:45:19 00:00:47:03

[CELESTE] Ow! But, what?

00:00:47:04 00:00:48:29

[CELESTE] Now you're going to get it.

00:00:49:00 00:00:50:01

[CELESTE] Uh!

00:00:50:05 00:00:55:24

[CELESTE] (vocal gestures) Ah!





00:00:57:08 00:01:06:07

[CELESTE] (vocal gestures) Ah! Very funny!

00:01:06:08 00:01:07:26

[MOON] Hello, Celeste.

00:01:07:26 00:01:09:19

[CELESTE] Hi, Moon.

00:01:09:28 00:01:12:17

[MOON] Is everything okay?

00:01:12:28 00:01:14:23

[CELESTE] No, nothing's going right.

00:01:14:24 00:01:19:01

[CELESTE] The book says it's easy, but it's super hard.

00:01:19:02 00:01:21:04

[CELESTE] Tomorrow I have to make a presentation

00:01:21:05 00:01:26:12

[CELESTE] at school and I wanted to take an origami dinosaur with me.

00:01:30:04 00:01:33:00

[CELESTE] Yeah, something like that.

00:01:33:04 00:01:36:08

[MOON] Are you going to talk about the dinosaurs?

00:01:36:09 00:01:40:04

[CELESTE] About how they went extinct? Hey!

00:01:40:05 00:01:43:06

[MOON] But not all the dinosaurs went extinct.

00:01:43:07 00:01:45:04

[CELESTE] What do you mean they didn't?!

00:01:45:05 00:01:48:26

[CELESTE] Everybody knows that the impact of a meteorite finished them off.



00:01:48:26 00:01:52:18

[MOON] And what if I told you that there are still dinosaurs among us?

00:01:52:19 00:01:56:10

[CELESTE] That would be amazing, but...

00:01:56:11 00:02:00:18

[MOON] Well, they're much closer than you think.

00:02:04:04 00:02:05:19

[CELESTE] A chicken?

00:02:05:28 00:02:09:10

[CELESTE] What does a chicken have to do with a dinosaur?

00:02:12:19 00:02:16:23

[MOON] Would you like to know?

00:02:16:24 00:02:18:12

[CELESTE] Sure.

00:02:18:17 00:02:19:25

[MOON] Come with me.

00:02:19:25 00:02:21:04

[CELESTE] Where?

00:02:21:05 00:02:23:19

[MOON] To the beginning.

00:02:59:18 00:03:02:29

[CELESTE] Are we inside the egg? I can't see anything.

00:03:03:00 00:03:04:21

[MOON] Be patient.

00:03:04:22 00:03:08:17

[MOON] Every story of survival  
begins with a birth.

00:03:11:10 00:03:13:06

[CELESTE] It's breaking.



00:03:15:12 00:03:18:05

[CELESTE] They're dinosaur eggs. Look, look.

00:03:18:06 00:03:21:16

[CELESTE] It's a Brachiosaurus. Wait a minute.

00:03:21:17 00:03:26:20

[CELESTE] It's similar to a Brachiosaurus, but look, it has spikes.

00:03:26:21 00:03:28:07

[MOON] Good eye.

00:03:28:08 00:03:31:14

[MOON] We've traveled back in time  
to the Cretaceous period.

00:03:31:15 00:03:34:27

[MOON] And what you're looking at is a Lohuecotitan.

00:03:34:28 00:03:37:14

[CELESTE] Whoa, what a strange name.

00:03:37:14 00:03:38:20

[CELESTE] I love it.

00:03:39:04 00:03:43:02

[CELESTE] What about a Dilophosaurus and the Stegosaurus?

00:03:43:03 00:03:44:09

[CELESTE] No, no, wait.

00:03:44:10 00:03:46:18

[CELESTE] I'm dying to see an Allosaurus.  
Ayyy...

00:03:46:19 00:03:49:02

[CELESTE] I want to see them all.

00:03:49:03 00:03:51:22

[MOON] (Moon laughing) The dinosaurs that,

00:03:51:23 00:03:59:21

[MOON] you know, lived on the Earth a long, long time, but not all at the same time.

# A STORY OF SURVIVAL DINOSAURS



00:03:59:22 00:04:00:27

[CELESTE] Oh, no?

00:04:00:28 00:04:02:08

[MOON] No.

00:04:02:09 00:04:08:26

[MOON] Over that period of time, some species appeared and others went extinct.

00:04:08:26 00:04:10:07

[CELESTE] Really?

00:04:10:08 00:04:11:20

[MOON] Yes.

00:04:11:21 00:04:16:25

[MOON] The story of the dinosaurs is a story of adaptation and survival

00:04:16:25 00:04:22:20

[MOON] that begins on a planet that was very different from the one we know now.

00:04:34:02 00:04:35:29

[CELESTE] What planet is that?

00:04:36:00 00:04:38:27

[CELESTE] It looks like the Earth, but...

00:04:38:28 00:04:40:07

[MOON] In reality...

00:04:40:07 00:04:41:00

[CELESTE] I know!

00:04:41:06 00:04:45:16

[CELESTE] It's an exoplanet! A Super-Earth beyond our solar system!

00:04:45:17 00:04:55:01

[MOON] (Moon laughing) Good thinking, but no, it's the Earth... 250 million years ago.

00:04:55:01 00:04:57:27

[CELESTE] But there's only one continent.



00:04:57:28 00:05:00:08

[MOON] Because in the Triassic period.

00:05:00:08 00:05:04:26

[MOON] They were all joined, forming a single supercontinent called

00:05:04:27 00:05:12:03

[MOON] Pangea, and surrounded by a single sea, Panthalassa.

00:05:12:04 00:05:16:14

[CELESTE] It looks so different!

00:05:15:05 00:05:19:00

[MOON] And I'm afraid It's going through some tough times.

00:05:19:21 00:05:26:11

[MOON] It's recovering from a mass extinction that has killed off 90% of the species.

00:05:26:12 00:05:28:22

[CELESTE] Including the dinosaurs?

00:05:28:23 00:05:29:28

[MOON] No.

00:05:29:29 00:05:34:18

[MOON] This extinction event happened before the dinosaurs appeared.

00:05:34:23 00:05:38:02

[CELESTE] But how many have there been?

00:05:38:03 00:05:42:04

[MOON] At least five great mass extinctions.

00:05:42:05 00:05:43:05

[CELESTE] Five!

00:05:43:06 00:05:52:12

[MOON] But as dark as the future may seem, life always, always finds a path forward.

00:05:52:14 00:05:54:14

[CELESTE] I adore life.



00:05:54:14 00:06:00:28

[MOON] And this is when the dinosaur's  
evolutionary adventure begins.

00:06:04:23 00:06:06:16

[CELESTE] Where are the dinosaurs?

00:06:06:17 00:06:08:12

[CELESTE] I don't see any!

00:06:09:04 00:06:12:19

[MOON] Let me see... Ah!

00:06:12:20 00:06:14:03

[MOON] There it is!

00:06:14:04 00:06:15:07

[CELESTE] Where!?

00:06:15:07 00:06:16:11

[MOON] There!

00:06:16:19 00:06:18:14

[MOON] It's the descendant of a reptile

00:06:18:15 00:06:25:23

[MOON] that survived the Great Extinction and it will give rise to all the dinosaurs.

00:06:25:24 00:06:28:04

[CELESTE] What a cool lizard!

00:06:28:17 00:06:34:21

[MOON] That lizard, as you call it, did something very interesting.

00:06:34:22 00:06:37:01

[MOON] It invented a way of walking...

00:06:37:01 00:06:41:01

[MOON] Some 240 million years ago.

00:06:41:01 00:06:43:16

[CELESTE] It's so cool!

# A STORY OF SURVIVAL DINOSAURS



00:06:45:23 00:06:48:21

[MOON] Well, it may seem simple,

00:06:48:22 00:06:54:11

[MOON] but this way of getting around would be the key to their evolutionary success.

00:06:54:12 00:06:57:13

[CELESTE] Hooray for the lizard.

00:07:05:06 00:07:08:09

[MOON] No, no, no... Keep still!

00:07:08:10 00:07:09:10

[MOON] Perfect!

00:07:09:11 00:07:10:29

[MOON] Don't move!

00:07:13:28 00:07:16:22

[CELESTE] Those are your bones!

00:07:18:08 00:07:23:12

[MOON] Unlike other reptiles, its legs are placed vertically below its body.

00:07:23:13 00:07:27:22

[MOON] You see,  
that helps it to move more and better,

00:07:27:23 00:07:32:01

[MOON] which means it can lead a more active life.

00:07:32:16 00:07:34:20

[MOON] Did you see that, Celeste?

00:07:34:21 00:07:40:02

[MOON] Dinosaurs can't put their hands or the soles of their feet down flat.

00:07:40:03 00:07:43:23

[CELESTE] They walk on tiptoe like ballet dancers.

00:07:43:24 00:07:45:08

[MOON] Exactly!

# A STORY OF SURVIVAL DINOSAURS



00:07:45:09 00:07:49:10

[MOON] That's a typical characteristic of good runners.

00:07:50:18 00:07:51:26

[MOON] Wait!

00:07:52:06 00:07:54:06

[MOON] We're not done yet!

00:07:56:28 00:07:58:19

[MOON] Look at its skull.

00:07:58:20 00:08:02:28

[MOON] You see, it has two pairs of openings.

00:08:02:29 00:08:05:25

[CELESTE] And another pair in its jaw.

00:08:06:00 00:08:07:25

[MOON] Good eye.

00:08:09:06 00:08:13:09

[CELESTE] Do all dinosaurs really descend from this little animal?

00:08:13:10 00:08:16:13

[MOON] Every single one.

00:08:19:01 00:08:29:13

[CELESTE] A Spinosaurus??!! And an Ankylosaurus!!

00:08:29:14 00:08:30:25

[CELESTE] It's incredible!

00:08:30:26 00:08:33:09

[CELESTE] They don't look anything like each other.

00:08:33:10 00:08:36:04

[MOON] Well, the same as a little Chihuahua doesn't

00:08:36:05 00:08:39:28

[MOON] look like a Wolf, even though it descends from one.



00:08:39:29 00:08:43:07

[CELESTE] There's also a Carnotaurus.

00:08:44:02 00:08:45:29

[MOON] The dinosaurs are one of the groups

00:08:45:30 00:08:49:26

[MOON] of land vertebrates that develop the most adaptations,

00:08:49:27 00:08:57:07

[MOON] giving rise over many millions of years to a large number of different species.

00:08:58:14 00:09:03:18

[CELESTE] Well, he doesn't look like he's enjoying the company of his descendants!

00:09:03:24 00:09:06:15

[CELESTE] You're the coolest dinosaur ancestor I've ever seen!

00:09:06:16 00:09:13:25

[CELESTE] (Celeste laughing) You're welcome!!

00:09:20:25 00:09:23:21

[CELESTE] Things look pretty dead around here...

00:09:23:22 00:09:28:14

[MOON] This is the beginning of the Triassic period and the climate is extreme.

00:09:28:15 00:09:33:02

[MOON] It's very hot and it hardly rains.

00:09:33:02 00:09:36:04

[CELESTE] The Earth is a ginormous desert?

00:09:36:05 00:09:39:15

[MOON] There are still a few forests in some places.

00:09:39:16 00:09:45:14

[MOON] But, yes, most of the Earth is arid and uninhabitable.

00:09:45:15 00:09:51:20

[MOON] Although that, little by little is going to change.

00:09:51:21 00:09:54:05

[CELESTE] Well, thank goodness.





00:10:03:12 00:10:05:14

[CELESTE] Pangea has broken up!

00:10:05:15 00:10:07:02

[MOON] That's right.

00:10:07:02 00:10:13:10

[MOON] More than 100 million years have gone by, and the supercontinent has split in two:

00:10:13:11 00:10:17:28

[MOON] Laurasia in the north and Gondwana in the south.

00:10:18:05 00:10:20:23

[CELESTE] But I still don't see the continents...

00:10:20:24 00:10:24:01

[MOON] No, millions more years will have to go

00:10:24:02 00:10:28:28

[MOON] by before these two land masses form the continent you know.

00:10:29:06 00:10:31:25

[CELESTE] Everything looks much greener!

00:10:31:26 00:10:36:25

[MOON] That's because the oceanic winds carried the rains to areas that were arid before

00:10:36:26 00:10:43:22

[MOON] then, and during some periods, the Earth's temperature became milder.

00:10:43:28 00:10:46:29

[MOON] New ecosystems emerged.

00:10:47:00 00:10:48:28

[CELESTE] And life made the most of them!!

00:10:48:28 00:10:50:19

[MOON] That's right.

00:10:55:05 00:10:57:26

[CELESTE] Now, this is a Brachiosaurus!

00:10:57:27 00:11:00:04

[CELESTE] Its name means reptile with arms because





00:11:00:05 00:11:03:04

[CELESTE] its front legs are bigger than its hind legs.

00:11:03:05 00:11:09:16

[CELESTE] They can measure up to 23 meters long and weigh up to 80 tons!!

00:11:09:17 00:11:12:16

[MOON] Wow. You know a lot!

00:11:12:17 00:11:14:16

[CELESTE] They live in herds, see?

00:11:14:17 00:11:19:05

[CELESTE] they are herbivores and can eat up to 400 kilos of plants a day.

00:11:19:06 00:11:20:19

[MOON] Correct.

00:11:20:20 00:11:24:16

[MOON] During the Jurassic, there were more resources to feed on,

00:11:24:17 00:11:29:19

[MOON] and some sauropods exploited their ability to grow to the maximum.

00:11:29:20 00:11:31:20

[CELESTE] You're not kidding!

00:11:31:21 00:11:35:25

[MOON] The only animals that are bigger are the ones that have freed themselves

00:11:35:26 00:11:41:05

[MOON] from the force of gravity by returning to the ocean like some whales.

00:11:41:06 00:11:44:08

[MOON] But we'll talk about  
that some other day...

00:11:49:06 00:11:52:26

[CELESTE] They are so super humongous!!

00:11:53:22 00:11:56:11

[MOON] That's a big evolutionary advantage to get



00:11:56:12 00:12:00:23

[MOON] food and to defend yourself from predators, don't you think?

00:12:00:24 00:12:01:11

[CELESTE] Well, yeah!

00:12:01:12 00:12:05:19

[CELESTE] I'd like to see who's gonna pick a fight with an animal that big.

00:12:05:20 00:12:09:19

[MOON] Perhaps a carnivore that has also grown bigger?

00:12:19:01 00:12:19:21

[CELESTE] Woww!

00:12:19:22 00:12:27:01

[CELESTE] They're so cool!... Although they're kind of scary...

00:12:27:07 00:12:29:10

[CELESTE] But not to me, of course.

00:12:34:22 00:12:36:03

[CELESTE] Well...

00:12:36:04 00:12:38:08

[CELESTE] maybe just a little bit.

00:12:39:29 00:12:42:08

[CELESTE] What are they doing, Moon?

00:12:45:26 00:12:48:20

[MOON] Not exactly...

00:12:50:00 00:12:52:29

[MOON] They're in the middle of courtship!

00:12:53:00 00:12:55:21

[CELESTE] In the middle of...? Oh!

00:12:55:22 00:12:58:03

[CELESTE] Don't tell me they're... flirting.





00:12:58:04 00:12:59:27

[CELESTE] Tell me that's not it.

00:12:59:28 00:13:01:29

[MOON] (Moon laughing) I'm afraid so.

00:13:01:30 00:13:08:29

[CELESTE] (Celeste vocal gesture) Stop already!

00:13:09:00 00:13:13:03

[MOON] (Moon laughing) That's life, Celeste.

00:13:13:04 00:13:16:13

[MOON] And it spreads throughout the planet!

00:13:17:22 00:13:20:17

[MOON] The land had split up, remember?

00:13:20:18 00:13:23:14

[MOON] And the dinosaurs, isolated in different

00:13:23:15 00:13:30:22

[MOON] areas of the planet, start to evolve differently and have different stories.

00:13:31:29 00:13:37:23

[MOON] During the Cretaceous period, flowering plants emerged.

00:13:42:13 00:13:43:23

[CELESTE] And grass!

00:13:43:24 00:13:47:07

[CELESTE] Look, it's growing everywhere!

00:13:48:13 00:13:55:11

[MOON] We've already seen the way some dinosaurs became huge, like Patagotitan.

00:13:55:12 00:13:57:01

[CELESTE] Awesome!

00:13:58:10 00:14:01:14

[MOON] But others, like Magyarosaurus,

00:14:01:15 00:14:06:05

[MOON] which lived on an island, are barely the size of a horse.





00:14:06:06 00:14:10:17

[MOON] Even though the two dinosaurs are sort of cousins.

00:14:11:13 00:14:15:23

[CELESTE] Because their evolution depends on where they live.

00:14:16:02 00:14:17:27

[MOON] You got it!

00:14:17:28 00:14:20:20

[MOON] The changes in the ecosystems select

00:14:20:21 00:14:25:25

[MOON] the animals that live in them  
in a process called speciation.

00:14:27:01 00:14:34:18

[MOON] Some species don't survive these changes and go extinct, while new species emerge.

00:14:35:00 00:14:38:08

[CELESTE] They're all over the world!

00:14:38:11 00:14:40:27

[MOON] That's right, Celeste.

00:14:40:28 00:14:48:10

[MOON] And up to now, we've seen only a small part of their story...

00:14:56:05 00:14:57:28

[CELESTE] An Ankylosaurus!!

00:14:57:29 00:14:59:23

[CELESTE] Its name means "armored lizard".

00:14:59:24 00:15:05:24

[CELESTE] It ate plants, and it can measure up to 9 meters long and weigh six tons.

00:15:05:28 00:15:08:03

[MOON] I'm impressed!

00:15:08:04 00:15:09:22

[CELESTE] Thank you.





00:15:10:29 00:15:14:28

[MOON] What you're looking at is another evolutionary trait.

00:15:14:29 00:15:18:28

[MOON] While some dinosaurs grow bigger or smaller,

00:15:18:29 00:15:24:00

[MOON] others like this Ankylosaurus that lived during the Cretaceous period developed

00:15:24:01 00:15:30:04

[MOON] a whole catalog of weapons: spikes, clubs, armored...

00:15:30:20 00:15:33:07

[CELESTE] Now, that's a good defense!

00:15:33:08 00:15:35:19

[CELESTE] Nobody's coming near him!

00:15:35:20 00:15:37:29

[MOON] Well, that was awkward!

00:15:38:00 00:15:41:16

[MOON] (Moon clears throat) Now, where was I?

00:15:41:17 00:15:43:01

[MOON] Oh, right.

00:15:43:02 00:15:45:07

[MOON] The plates may have had other purposes

00:15:45:08 00:15:49:26

[MOON] at first, but they undoubtedly became fabulous defensive features.

00:15:49:27 00:15:51:17

[MOON] Don't you think?

00:15:52:16 00:15:56:13

[CELESTE] If I could have my pick, I turn into humungous dinosaur

00:15:56:14 00:16:00:26

[CELESTE] with lots of teeth and tough armor that nobody could pierce...



00:16:00:27 00:16:04:19

[CELESTE] The biggest super dinosaur of all time!

00:16:04:20 00:16:06:13

[MOON] Are you sure?...

00:16:06:22 00:16:11:16

[MOON] It's not always a good thing to go through life covered with armor.

00:16:13:07 00:16:18:17

[MOON] In any case, diversity doesn't just mean anatomical differences.

00:16:18:18 00:16:21:08

[MOON] It also refers to developing new behavior.

00:16:21:09 00:16:24:12

[CELESTE] (Celeste laughing) Moon, help!!!

00:16:28:29 00:16:31:11

[CELESTE] A Psittacosaurus!

00:16:31:12 00:16:32:20

[CELESTE] Oh, no!

00:16:32:21 00:16:34:28

[CELESTE] It's gotta get out of here!

00:16:34:29 00:16:37:04

[CELESTE] The volcano is erupting!

00:16:37:05 00:16:39:13

[MOON] I don't think it's willing to go.

00:16:39:14 00:16:40:15

[CELESTE] But why not?

00:16:40:16 00:16:42:13

[CELESTE] It's in danger!

00:16:42:14 00:16:46:27

[MOON] Because although the majority of dinosaurs didn't care for their young,



00:16:46:28 00:16:50:14

[MOON] paleontologists have discovered that some species did.

00:16:50:15 00:16:56:09

[CELESTE] It's a baby Psittacosaurus!

00:16:56:10 00:16:57:17

[MOON] Yes.

00:16:57:18 00:16:59:14

[MOON] It's very important for your parents

00:16:59:15 00:17:04:21

[MOON] to take care of you when you're little in order to survive, don't you think?

00:17:04:22 00:17:06:14

[CELESTE] No kidding!

00:17:11:00 00:17:14:23

[CELESTE] There's something I don't understand. Okay...

00:17:14:24 00:17:19:20

[CELESTE] I know that we've learned lots of things  
about dinosaurs through fossils, but...

00:17:20:06 00:17:23:10

[CELESTE] also how they behaved or the color of their skin?

00:17:23:11 00:17:26:07

[MOON] In some cases, that's possible

00:17:26:08 00:17:30:24

[MOON] at exceptional digs that offer loads of information.

00:17:34:23 00:17:40:08

[MOON] It's a Concavenator corcovatus found on the Iberian Peninsula.

00:17:40:29 00:17:44:17

[CELESTE] Wow!! That's a really cool fossil!!

00:17:44:18 00:17:47:07

[CELESTE] It's the whole skeleton!



00:17:47:08 00:17:50:29

[MOON] And part of the outline of its body.

00:17:51:24 00:17:54:08

[MOON] We can see that it had sharp teeth

00:17:54:09 00:18:04:05

[MOON] with serrated edges, claws on its hands, and a strange hump.

00:18:04:06 00:18:05:29

[MOON] You see it here?

00:18:10:02 00:18:10:14

[CELESTE] Yeaah!

00:18:10:15 00:18:17:02

[MOON] And if you look closely, you can see more than just the bones.

00:18:19:11 00:18:22:19

[MOON] There are impressions of the skin

00:18:22:28 00:18:28:28

[MOON] and imprints of scales and of the pads on the soles of its feet.

00:18:29:18 00:18:33:19

[MOON] Thanks to fossils, paleontologists can suggest what

00:18:33:20 00:18:37:26

[MOON] an extinct species shape and appearance were like.

00:18:37:27 00:18:43:03

[CELESTE] Whoa... Being a paleontologist must be incredibly cool!

00:18:43:04 00:18:49:04

[MOON] But their proposal depends on the information that they have at that time.

00:18:49:05 00:18:54:19

[MOON] And sometimes new data can change everything we thought we knew.

00:18:54:20 00:18:56:05

[CELESTE] In other words,



00:18:56:06 00:19:01:00

[CELESTE] one day you think you know it all, and the next day you don't know anything.

00:19:01:06 00:19:04:13

[MOON] Actually, you know more.

00:19:04:14 00:19:10:00

[MOON] Science, Celeste, is a path of continuous learning.

00:19:10:01 00:19:14:00

[CELESTE] Dinosaurs are soooo cool!

00:19:14:01 00:19:16:16

[MOON] It's a shame that none of the adaptations

00:19:16:17 00:19:21:02

[MOON] that we've seen prepared them for the catastrophe that was coming.

00:19:21:02 00:19:22:28

[CELESTE] Catastrophe?

00:19:30:25 00:19:33:03

[CELESTE] Oh! The asteroid!

00:19:33:04 00:19:34:24

[CELESTE] I almost forgot!

00:19:35:26 00:19:41:05

[MOON] The most accepted theory says that it was an asteroid that crashed into the Earth.

00:19:41:06 00:19:43:10

[MOON] Although some new research argues that it

00:19:43:11 00:19:46:24

[MOON] might have been a comet from the Oort Cloud.

00:19:47:14 00:19:51:23

[CELESTE] It's a comet! I can see it's tail!

00:19:52:25 00:19:55:22

[CELESTE] And you say it came from a cloud?

00:19:55:23 00:19:59:29

[MOON] The Oort Cloud is found on the outer edges of the Solar System



00:20:00:00 00:20:05:16

[MOON] and is made up of millions of Comets that revolve around the Sun.

00:20:21:02 00:20:24:11

[MOON] Most of them stay very far from the Earth,

00:20:24:12 00:20:30:03

[MOON] but sometimes due to the force of gravity or even to a collision between them.

00:20:30:04 00:20:33:29

[MOON] They can change paths.

00:20:35:17 00:20:36:15

[CELESTE] Moon...

00:20:36:16 00:20:40:12

[CELESTE] Could an asteroid or a comet crash into the Earth again?

00:20:40:26 00:20:41:29

[MOON] Yes,

00:20:42:00 00:20:46:11

[MOON] but there are people who dedicate their lives to watching the skies,

00:20:46:12 00:20:50:07

[MOON] and the probability of a major impact is low.

00:20:53:24 00:20:58:18

[MOON] Look, Celeste, this is the Earth in its early days.

00:20:58:25 00:21:01:10

[CELESTE] They're crushing us!

00:21:01:11 00:21:09:06

[MOON] And providing substances, including water, which is essential to life as we know it.

00:21:18:01 00:21:23:08

[CELESTE] Then... It's not always bad when they crash into us?

00:21:23:13 00:21:27:16

[MOON] Well, right now, like 66 million years ago,



00:21:27:17 00:21:31:07

[MOON] it would not be at all good for most of the life on the planet...

00:21:31:08 00:21:37:22

[CELESTE] I can't watch!

00:21:37:23 00:21:39:23

[MOON] I'm not surprised.

00:21:39:24 00:21:44:24

[MOON] We're at the end of the Cretaceous and an asteroid or a comet bigger than

00:21:44:25 00:21:52:08

[MOON] Mount Everest is going to hit the Earth at a speed 100 times faster than a bullet.

00:21:55:07 00:21:57:23

[MOON] The impact created an enormous crater

00:21:57:24 00:22:03:22

[MOON] in today's Yucatan Peninsula, and its effects were devastating.

00:22:03:23 00:22:09:21

[MOON] The shockwave and the fires immediately wiped out part of the life on the planet.

00:22:09:22 00:22:12:05

[MOON] It caused big earthquakes and created

00:22:12:06 00:22:16:02

[MOON] tsunamis that were hundreds of meters high.

00:22:16:02 00:22:18:12

[CELESTE] This is killing me!

00:22:18:24 00:22:23:01

[MOON] I'm afraid that is precisely what happened...

00:22:32:12 00:22:35:02

[MOON] The atmosphere was full of an enormous

00:22:35:03 00:22:41:25

[MOON] amount of ash, and the planet was covered by shadow for a time.



00:22:42:16 00:22:49:00

[MOON] All of the big animals died off, and most of the little ones too.

00:22:51:11 00:22:54:20

[MOON] 75% of the plant and animal species

00:22:54:21 00:22:59:10

[MOON] that existed on the planet at that time disappeared.

00:22:59:12 00:23:01:13

[CELESTE] That's so sad!

00:23:01:14 00:23:04:16

[CELESTE] And everything was going so well...

00:23:04:17 00:23:08:28

[MOON] In reality, not everything was going so well on Earth.

00:23:08:29 00:23:14:04

[MOON] Long before the asteroid hit, gigantic volcanic eruptions were already

00:23:14:05 00:23:18:26

[MOON] causing a climate change that was threatening life.

00:23:18:27 00:23:22:19

[CELESTE] So... it wasn't all the fault of the asteroid...

00:23:22:20 00:23:24:05

[CELESTE] or comet?

00:23:24:24 00:23:29:24

[MOON] What we do know is that it was the final blow.

00:23:31:12 00:23:33:19

[CELESTE] The poor dinosaurs!

00:23:33:20 00:23:36:21

[CELESTE] So much growing, arming themselves

00:23:36:22 00:23:41:10

[CELESTE] and adapting just to get wiped out in the end.





00:23:41.05 00:23:44.18

[MOON] I didn't say they all disappear

00:23:45:01 00:23:48:00

[CELESTE] Some dinosaurs survived?

00:23:48:10 00:23:49:22

[MOON] A few.

00:23:49:23 00:23:51:20

[MOON] And the ones that did

00:23:51:21 00:23:56:19

[MOON] had a fascinating evolutionary trait that we haven't mentioned yet.

00:23:56:19 00:24:01:17

[CELESTE] What!? A bird's feather!

00:24:01:26 00:24:05:18

[MOON] It's a feather, but not a bird's.

00:24:11:23 00:24:16:12

[CELESTE] Wait! Is that... a dinosaur with feathers?

00:24:16:29 00:24:20:17

[MOON] Allow me to introduce you to Citipati

00:24:20:18 00:24:26:16

[MOON] which lived in the Upper Cretaceous more than 70 million years ago.

00:24:26:17 00:24:31:19

[MOON] The fossils found belonging to this animal are one of the many pieces of evidence

00:24:31:20 00:24:35:05

[MOON] that confirmed that many dinosaurs had feathers.

00:24:35:06 00:24:39:01

[CELESTE] (Celeste vocal gesture) And what feathers!

00:24:39:02 00:24:42:19

[MOON] Well, initially they were simple quills,





00:24:42:20 00:24:47:10

[MOON] but over time, they became much more complex.

00:24:48:12 00:24:50:17

[CELESTE] I think it wants to fly!

00:24:51:14 00:24:55:11

[MOON] It'll need a lot more than feathers to do that...

00:24:55:18 00:25:00:28

[MOON] Look, its arms are too short and its body is too heavy.

00:25:00:29 00:25:03:10

[MOON] Citipati can't fly.

00:25:03:11 00:25:04:20

[CELESTE] Then...

00:25:04:22 00:25:07:04

[CELESTE] what are the feathers for?

00:25:07:05 00:25:10:16

[MOON] Well, they also serve other purposes,

00:25:10:17 00:25:15:28

[MOON] like regulating its body temperature, camouflage, or attracting a mate.

00:25:15:29 00:25:20:10

[CELESTE] But did dinosaurs eventually manage to fly or not?

00:25:20:11 00:25:22:29

[MOON] Some of these small dinosaurs probably

00:25:22:30 00:25:28:11

[MOON] moved their feathered arms to run faster and move forward with jumps.

00:25:28:12 00:25:30:17

[MOON] And the longer their arms...

00:25:30:18 00:25:32:14

[CELESTE] The faster they could go!



00:25:32:15 00:25:39:05

[MOON] Until those feathered arms became wings able to keep them in the air and...

00:25:39:10 00:25:42:13

[CELESTE] They're flying, they did it!

00:25:42:14 00:25:51:01

[MOON] The first dinosaurs to be able to fly did so at least 150 million years ago.

00:25:51:13 00:25:54:16

[CELESTE] Birds are dinosaurs!!

00:25:54:17 00:25:55:26

[MOON] That's right.

00:25:55:27 00:25:58:17

[MOON] A few dinosaurs that were able to fly

00:25:58:18 00:26:03:04

[MOON] survived the extinction event and evolved into all of today's birds.

00:26:03:04 00:26:08:11

[CELESTE] Yahooooo! Birds have all over the planet.

00:26:08:12 00:26:11:23

[CELESTE] There are still dinosaurs all over the world.

00:26:11:24 00:26:17:23

[MOON] I told you the story of the dinosaurs is a story of adaptation and survival.

00:26:17:24 00:26:21:12

[MOTHER] Celeste what's all that racket?

00:26:22:07 00:26:24:14

[CELESTE] It's nothing, mom.

00:26:24:15 00:26:26:01

[MOON] Shh.

00:26:26:02 00:26:27:20

[MOON] Time to go.

# A STORY OF SURVIVAL DINOSAURS



00:26:27:20 00:26:28:23

[CELESTE] Bye...

00:26:30:08 00:26:33:07

[CELESTE] My friends are gonna flip!

00:26:39:10 00:26:40:22

[CELESTE] Mom, Mom!

00:26:40:23 00:26:42:08

[CELESTE] You're not gonna believe it!

00:26:42:09 00:26:44:01

[CELESTE] There's a dinosaur in the yard!

**END**