At dawn in the desert
where winds and sand blow,
Pismo wishes for friends.
Where, oh where, could he go?

1

Today, the Halocene Geological Time Period Began 11,700 years ago after the last major ice age.

dromedary (DRAA • muh • deh • ree) (I have one hump.)

haboob (huh • BOOB) A violent wind blowing in summer stirring up sand and creating a wall of sediment that precedes the storm cloud.

@Sahara Desert, Northern Africa

He asks sandstorm, Haboob,
to take him away,
to travel in time
to find friends who might play.

Haboob takes him back
to visit the Dawn
when the Earth was all water.
There's not even a lawn.

2 Archean ~4–2.5 billion years ago. It is thought that the Earth was covered in water between 3–4 billion years ago.
@Water World

Pismo looks for some friends
but they're too small to see.
Tiny creatures in the ocean
that's all that there be.

So he calls for Haboob,
"Please take me away
to a new Dawn where someone
will come out and play!"

2 single-celled organisms *aka* microbes Our oldest fossils date to roughly 3.5 billion years ago, and consist of bacteria microfossils.

"Where am I now?"
Pismo wonders and stares.
He takes a look up – up – up as it glares.

Then he sees great. BIG. TEETH.

So he whispers to Haboob,
"Please take me away
to a new Dawn where someone
will come out and play!"

3

Mesozoic ~250-65.5 million years ago. Dinosaurs rule, but mammals appear and the first flowering plants evolve.

Tyrannasaurus Rex *aka* T-Rex (tr • a • nuh • SAW • ruhs REKS) King of the Dinosaurs. A meat-eater with ridiculously tiny arms!

@Western North America

Pismo's excited to see ancient whales by the shore.
But the land did not suit them. It was really a bore.
They head back to the sea with no time to chat.
A better home lies ahead, and that is just that!

So he calls for Haboob,
"Please take me away
to a new Dawn where someone
will come out and play!"

4

Eocene Period ~45.5–36.5 million years ago – a guesstimate for when the ancient whales returned to the sea. Given water covers about 70% of Earth today and there are far less predators, that was a smart move to return to from where they began!

Rodhocetus (rod • ho • CE • tus) Their descendants evolved into modern whales.

@Pakistan

Haboob now fast-forwards,
racing through time,
to try life in the future
and friends they might find.

Pismo's next stop is somewhere
years from Today.
He meets Robbie, the robot
who's not programmed for play.

So he calls for Haboob,
"Please take me away
to a new Dawn where someone
will come out and play!"

5

1,000 Years from now

Artificial Intelligence When a computer program or machine has the ability to think, learn, plan, and solve problems!

@Smart City of the Future

Now they head to a future,
far, far away.
But the land is too hot.
There is no one to play.

The sand turned to glass
with the heat of the sun.

"Please take me back, Haboob.
This is really no fun."

6

2.8 Billion Years from Now Earth's surface temperature will reach around 420 K (147 °C; 296 °F), even at the poles. Sand melts when heated to about 1700°C. So it isn't hot enough to turn sand into glass, but it made for a fun Fantasy Scene!
@South Pole

Pismo's home, home at last,
and he suddenly finds
that the friends he's been seeking
were here the whole time.

They run up to greet him.
They've missed him a lot.
Pismo learns to be thankful
for all that he's got.

1

dragonfly Dragonflies are found all over the world. Today, there are around 7,000 species of true dragonflies, in the group Odonta, which goes back 325 million years.

ostrich Flightless bird of Africa who lays the largest eggs of any living land animal. There are two living species of ostrich, the common ostrich and the Somali ostrich.

gundi A species of rodent found in Algeria, Libya, Morocco, and Tunisia distinguished by its comblike rows of bristles on the inner two toes of each hindfoot. A little over 7 oz., gundis move fast on their short legs.

@Sahara Desert, Northern Africa

The Timeline

On each page, draw a line to match the scene from Pismo's time travel to the Time Era it belongs to.

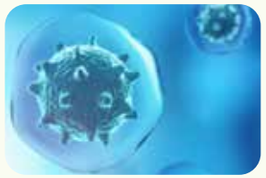
Hadean

3–4 BYA: It is thought that the Earth is covered in water.

4.6 BYA: Earth forms. The moon forms about 100 million years after.

Archean

3.5 BYA: First evidence of single-celled organism.



Proterozoic

2 BYA: First cells containing internal "organs" and a DNA-containing nucleus. It is possible that multi-cellular life develops.

2.4 BYA: Earth's atmosphere fills with oxygen. A million years later, Earth freezes over.

Paleozoic

310 MYA: Four-legged animals, not including amphibians, split into reptiles and "mammal-like" reptiles. Mammals evolve from the second.

340 MYA: The first amphibians.

397 MYA: The first animals with four legs (tetrapods) evolve, the common ancestor of all creatures with two or four legs, including humans.

500 MYA: Plants grow on land.

535 MYA: Within a few million years, called the 'Cambrian Explosion,' the first true vertebrate (an animal with a backbone) appears.

Mesozoic

130 MYA: The first flowering plants evolve.

150 MYA: Archaeopteryx, "the first bird," lives in Europe.

200 MYA: First mammals appear.

250 MYA: Dinosaurs evolve and begin to dominate the Earth until 65 MYA.

Cenozoic

Today – the Holocene epoch

300,000 years ago: The first "modern" human, *Homo sapiens*, evolves in Africa.

6.5 MYA: *Hominins*, early ancestors of humans, evolve from the other primates.

45.5–36.5 MYA: Ancient whales returned to the sea.

60 MYA: The first primates appear.

BYA: Billion Years Ago
MYA: Million Years Ago

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Random Facts Inspiring This Story

Eon goes back to the Greek *aiōn*, "age." An age is not easy to measure, and neither is an eon. Both are just really long periods of time, but in science an eon is about a billion years. If you sit down to dinner hanging your head and moaning that it's been an eon since you ate anything, you're exaggerating.

The geologic history of the Earth is broken up into hierarchical chunks of time. From largest to smallest, this hierarchy includes **eons, eras, periods, epochs, and ages**.

Very simple cells lived on Earth for the first few billion years of Earth's history. Our oldest fossils date to roughly 3.5 billion years ago and consist of bacteria microfossils.

Phillip Gingerich, a vertebrate paleontologist at the University of Michigan in Ann Arbor, and his colleagues discovered two 47-million-year-old whale specimens in Pakistan, in 2000 and 2004. The first whale was a female of a new species the team called Maiacetus inuus.

In 1,000 years, we'll probably have a thriving civilization on Mars, the Moon, or maybe even another planet beyond the solar system. There are 40 billion Earth-like planets in our own galaxy alone.

Intelligence is the ability to learn and to deal with new situations. When a computer or a robot solves a problem or uses language, it may seem to be intelligent, but it is called **artificial intelligence, or AI**.

Gundi, (family *Ctenodactylidae*), any of five North African species of rodents distinguished by its comblike rows of bristles on the inner two toes of each hindfoot.

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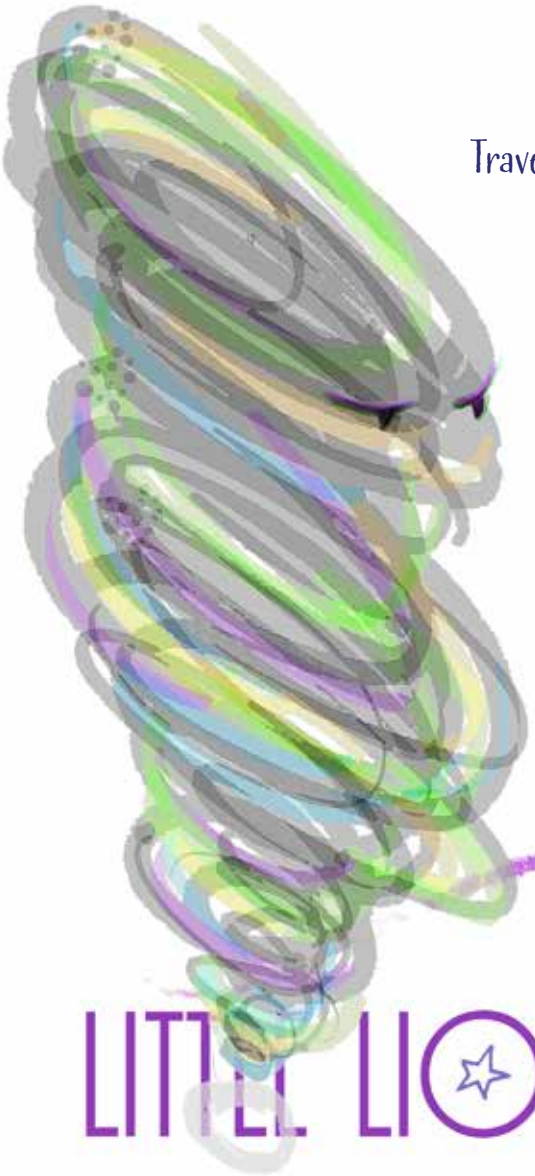

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