

The Tiny Animals





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Lisa's Great Adventure with Grandpa Bob



Written by



Robert William Schmieder,



also known as "Grandpa Bob"



For

Lisa Louise Schmieder

It is my sincere hope that this book
will remind you of the magic and
power of your imagination.

I will always treasure the adventure
so briefly captured here.

The Tiny Animals

Lisa lives near a big meadow.



One day Lisa went walking in the meadow with Grandpa Bob. They went to look for tiny animals.

Suddenly, she thought she saw something move!

She wanted to know what it was, so she walked toward it very quietly.

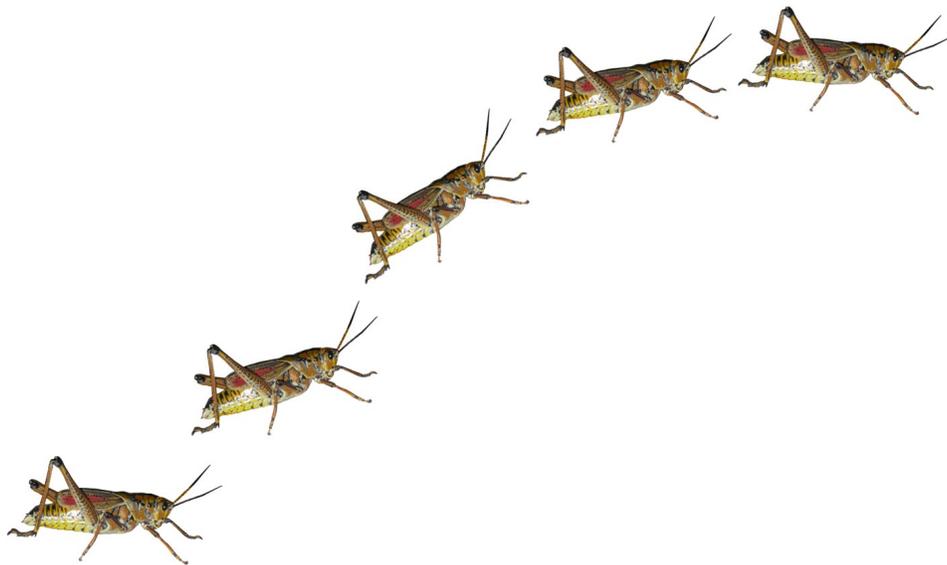


When she looked down in the grass, Lisa saw that it was a tiny animal. It was a *grasshopper*. She had never seen one exactly like this one.



The grasshopper had big legs in the back, and little legs in the front. It was walking slowly on the grass.

Lisa reached out one finger and almost touched it. Suddenly, it jumped high in the air and flew away!

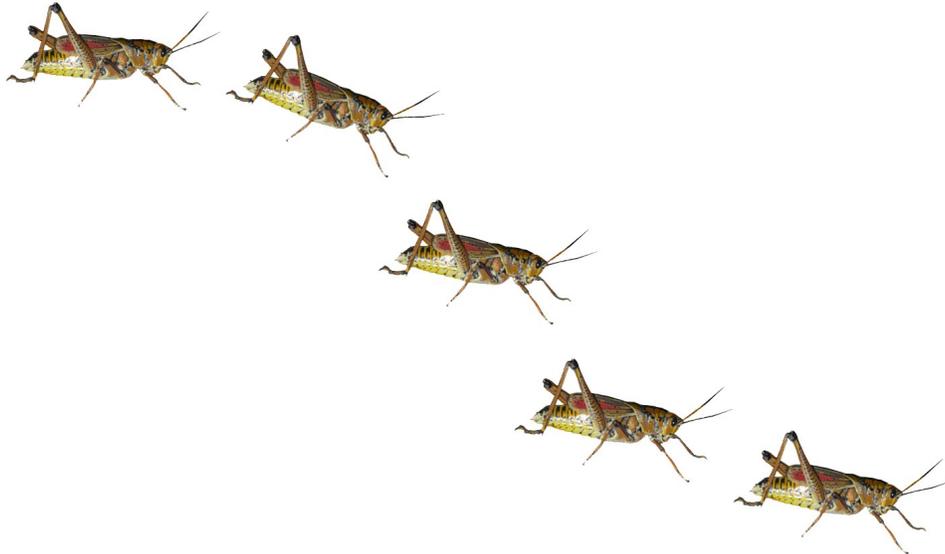


Lisa ran after it and saw where it had landed. She looked at it for a long time, and then tried to touch it again, and it jumped away again.



This was a fun game, but finally she could no longer find the grasshopper.

Lisa was sad because she wanted to play with the grasshopper, but the grasshopper probably didn't understand that and was afraid Lisa might hurt it.



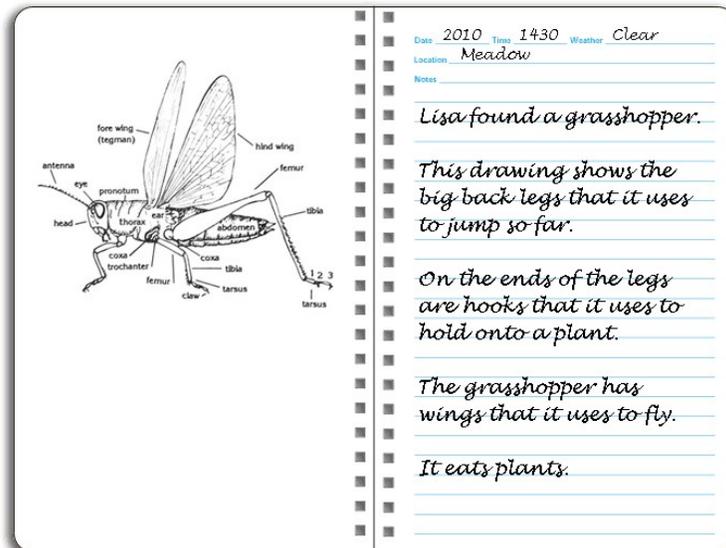
“How does it jump so high?” Lisa asked Grandpa Bob.

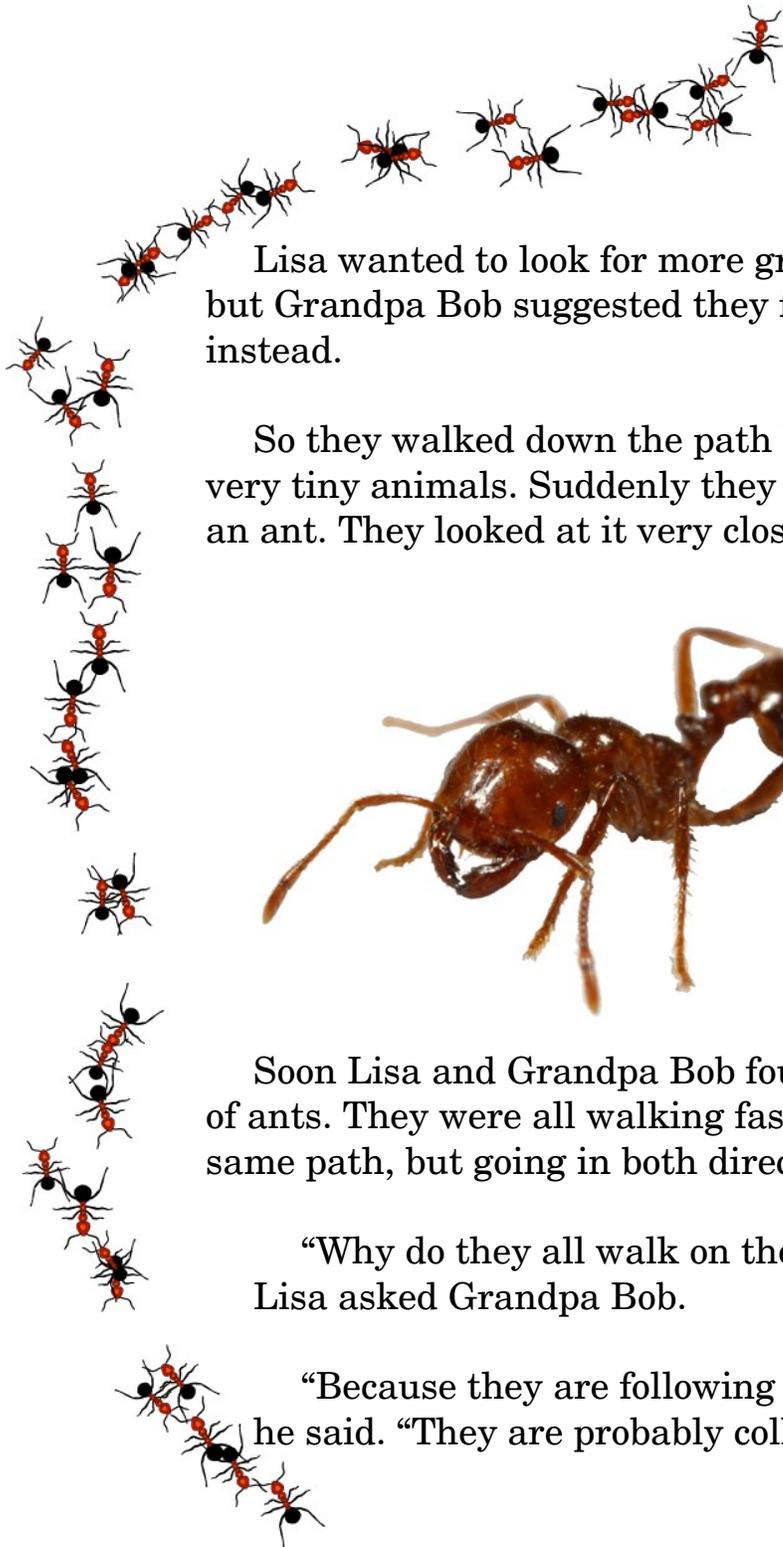


Grandpa Bob found another grasshopper in the grass, and very quietly they came close so they could see it better. He said “See how big the back legs are? It uses those big

legs to jump up high. And it has wings so it can fly.”

He had a notebook and a pencil with him and he made a drawing for Lisa.





Lisa wanted to look for more grasshoppers, but Grandpa Bob suggested they follow a path instead.

So they walked down the path looking for very tiny animals. Suddenly they came upon an ant. They looked at it very closely.

Soon Lisa and Grandpa Bob found hundreds of ants. They were all walking fast along the same path, but going in both directions.

“Why do they all walk on the same path?”
Lisa asked Grandpa Bob.

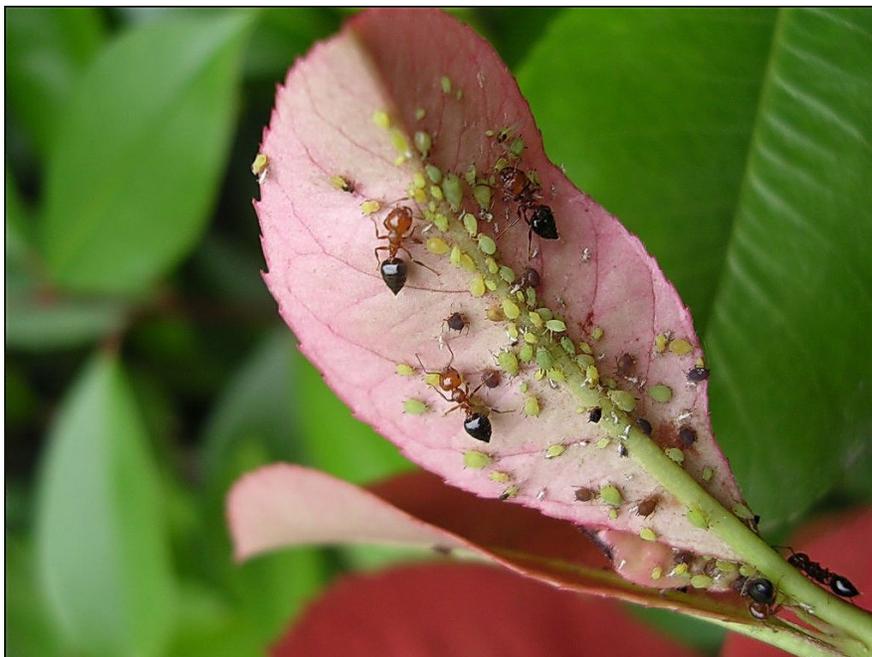
“Because they are following each other,”
he said. “They are probably collecting food.”



Lisa and Grandpa Bob walked further down the path, following the trail of ants. Soon the trail went up into a bush.

They watched the ants walk under the leaves of the bush. Then they looked on the bottom of a leaf, and were very surprised to see hundreds of very, very, very tiny animals.

“Those are *aphids*,” Grandpa Bob said.



The aphids were so small they had to get the magnifying glass Grandpa Bob had in his pocket.

With the magnifying glass, they could see an aphid much better. It was green, like the plant.



“Are the aphids and the ants friends?” Lisa asked.

Grandpa Bob explained: “The ants help the aphids by protecting them, and the aphids help the ants by making food for them. They help each other, and so they live together like friends.”

Suddenly Grandpa Bob had an idea. “I could take a picture of the aphids and you could show it to your teacher and friends at school. Would you like that?”

“Yes!” said Lisa.

So Grandpa Bob got his camera and took many pictures of the ants and the aphids.



Here is one of the pictures Grandpa Bob took.

How many ants do you see?

How many aphids do you see?

After they looked at the ants and the aphids for a long time, Lisa and Grandpa Bob walked further down the path and into another open area of the meadow, looking for more tiny animals.



There
were many
wild flowers
in the
meadow.



They walked up to an old tree stump that was almost completely rotted away.



“That would be a good place to look for tiny animals,” said Grandpa Bob.

When they turned over a piece of the old stump, they saw lots of little animals running around in all directions. Grandpa Bob told her those are *pill bugs*.



They looked at the pill bugs closely, and used the magnifying glass to see them better.

This is how big they actually were:



But with the magnifying glass they looked *very* big:



Grandpa Bob turned one over in his hand and they looked at the bottom side.

Lisa was surprised to see so many legs.

“Why do they have so many legs?” she asked.

“They use these legs to walk around in the dirt and sand,” he explained. “The legs help them move.”

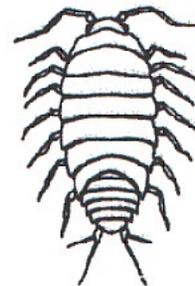


Grandpa Bob got his camera and took a picture of some of the pill bugs.



Lisa noticed that some of them seemed to be rolled up in balls. “Why do they do that?” she asked Grandpa Bob.

“That is the way they protect themselves. When something bothers them, they can roll up into a ball and make it more difficult to be harmed.



Grandpa Bob then made a sketch of the pill bug in his notebook. And he took more pictures of the pill bugs.

Lisa and Grandpa Bob dug a little more around the old stump. Suddenly Lisa exclaimed “There’s a black bug!”

Grandpa Bob came over and looked, and sure enough, the black bug was walking away, looking for a place to hide.



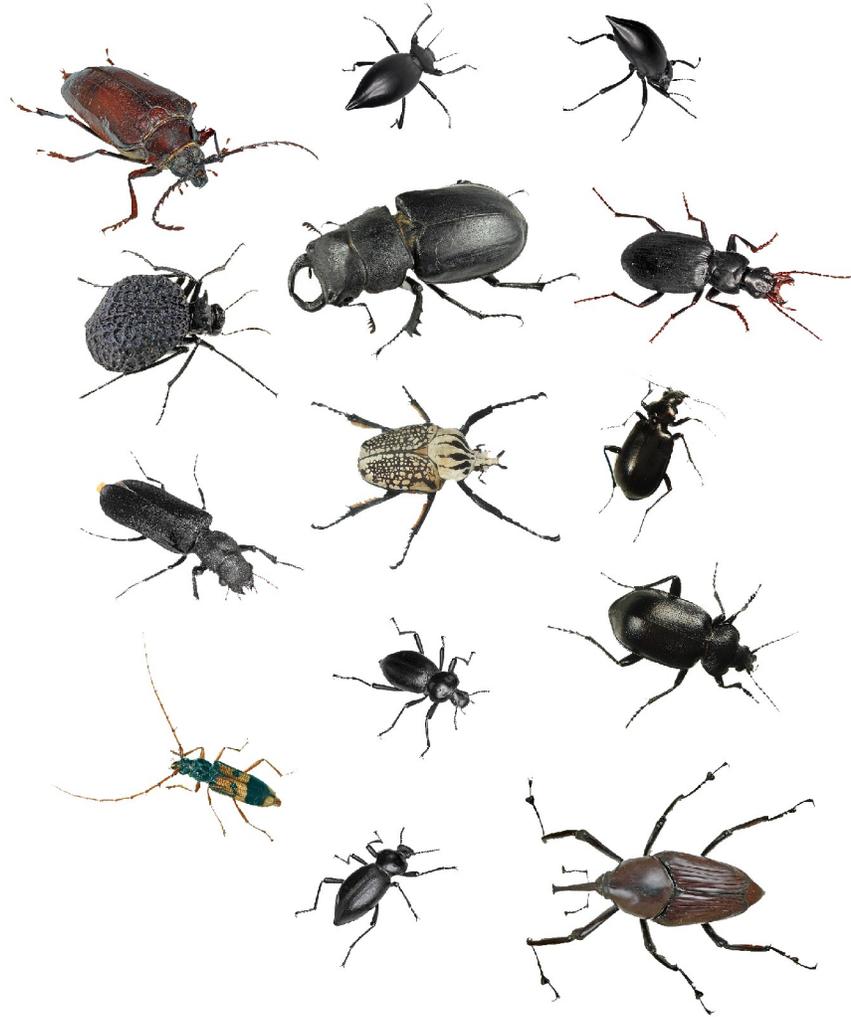
“That’s a beetle,” said Grandpa Bob. “There are a million different kinds of beetles, and this is just one of them.”

Can you count how many legs this beetle has?

“Every single beetle has exactly six legs,” said Grandpa Bob. “That’s because they are all *insects*. All insects have exactly six legs, three legs on one side and three legs on the other side. See how the beetle walks? That’s the way all insects walk.”

Grandpa Bob had a little book in his pocket with lots of pictures of beetles in it. He showed some of the pictures to Lisa. She thought they all looked the same, but Grandpa Bob told her to look more closely.

Can you see the differences between the beetles?



Did you know that most beetles have wings and that they can fly?



Looking around some more, they found a very pretty beetle. It was green and brown and shiny. Grandpa Bob said it was called a Japanese beetle.

Grandpa Bob asked Lisa a question. “Lisa, did you know that beetles only live part of their lives flying around looking like beetles? Actually, beetles live most of their lives in the ground looking like a worm or caterpillar.”

Lisa didn’t know that. “What does it look like when it lives in the ground?” she asked.

“Let’s see if we can find one.” Grandpa Bob said.

They got a strong stick and dug deeply into the soil around the old rotted tree stump. After a lot of work, they finally found a little white worm-like animal that moved just a little bit because it was disturbed.



“There it is,” said Grandpa Bob. “That is called a *grub*, and it will turn into a Japanese beetle. It lives in the ground almost all year long, and then turns into a beetle. The beetle lays eggs that hatch into grubs that will make new beetles. We’re very lucky to have found both a beetle and a grub.”

Lisa was a bit hungry, so they stopped looking at beetles for a while and sat down on a fallen log to eat the sandwiches that they had brought. When she dropped a little piece of her sandwich, a fly landed on the log next to her.



Lisa had seen lots of flies, but this one was not exactly the same as the others. This fly kept its wings open, but they were pulled down low. Suddenly she had a good question for Grandpa Bob.

“How do flies fly?”

Grandpa Bob knew the answer, because many years ago he had asked the same question to his mother.

“Flies have very tiny muscles inside their body. They use these muscles to pull their wings up and down, which makes the fly fly!”

After they finished their sandwiches, Lisa and Grandpa Bob started to walk around the end of the meadow. They found a creek there, and the area around it was wet. There were a lot of dead leaves and it was slippery. They had to walk carefully.

“What’s *that*?” cried Lisa.

She had just seen a very strange little animal. It was all yellow and looked like a worm, Lisa was pretty sure it was not a worm.



“That’s a banana slug,” said Grandpa Bob. “It is like a snail, but it doesn’t have a shell.”

Lisa touched it very carefully—it was wet and slimy. It had tiny eyes in the ends of its eye stalks. It tried to go the other way, but banana slugs don’t move very fast.

As they started walking back, Lisa thought she saw something in a branch of a tree so she walked over to look at it. It was a beautiful spider web.



“Where’s the spider?” Lisa asked.

“I think it might have hidden when you walked up,” Grandpa Bob said. “Spiders are very shy, and hide when there is danger. By the way, do you see how the web is made? It has a lot of circles and a lot of straight lines. The circles are sticky so they can catch insects that accidentally fly into the web. But the lines are not sticky so the spider walks on the lines so it doesn’t get stuck in its own web.”

“Look!” exclaimed Lisa. “There is a fly in the web.” They watched for a long time, but the spider didn’t come out from wherever it was hiding. “Maybe the spider isn’t hungry,” she said. Grandpa Bob agreed.

Lisa and Grandpa Bob walked on toward home. As they walked, Lisa saw two animals that seemed to be the same kind:



Salamander



Tree lizard

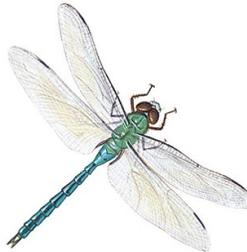
But Grandpa Bob explained that they are not the same. They are not closely related. They look very similar but they are actually very different animals. One was a salamander and the other was a lizard.

The salamander is an amphibian. Those animals live in and around water. They have four toes on their front legs and five toes on their back legs. If a salamander has an accident and one of its legs gets hurt or is broken off, it can grow a new one.

The lizard is a reptile. They live on dry land. If it gets too cold, lizards stop moving. That's why you see them sitting in the sun to get warm, so they can move. If another animal wants to eat it, the lizard can drop off its tail and later grow a new one.

When they got home, Lisa's Mom and Dad wanted to know what they had seen. Grandpa Bob showed everyone the picture she had taken.

Do you know the animals in these pictures?



At dinner, Lisa said she wanted to go to the meadow again. Grandpa Bob said that he would go with her, and maybe they could see many more tiny animals.

And they did, but that is another story...

Who is "Grandpa Bob"?



I am extraordinarily lucky—I have six grandchildren. Sadly, most of us live too far apart, scattered around the world really, to have as much time together as I would like. But that doesn't prevent me from enjoying many adventures that we could have together if only we lived next door. This book captures, ever so briefly, one such virtual adventure I had with Lisa. Our adventure started when she discovered a tiny animal in a meadow near her home. Immediately we began to look for more, searching in the grass and under leaves, under rocks and logs. With each discovery, we felt the thrill of learning something new. I hope this story will give you an idea of how exciting this was for us, and how important.

When I was not having adventures with Lisa, I earned a living as a physicist. I studied the structure of atoms, how light bounces around collections of mirrors, how to make new elements in an accelerator, how atoms can be torn into pieces, what happens when a laser beam passes through a crystal, how a laser can make a spark, how a radioactive atom can tear a molecule apart and make it give off light, how a flame makes soot, how a bunch of simple objects can get together to do really complicated things, how to make a flat screen color TV, and how to use nanotechnology to make a computer that would be better than any computer that has ever been built.

When I wasn't busy with these activities, I did a lot of traveling, on all seven continents. I have been to Australia, Canada, Chile, China, Egypt, Ecuador, the Galapagos Islands, Indonesia, Israel, Mexico, all 50 States, and nearly every country in Europe. For many years, I organized and led expeditions to very remote places in the ocean, especially exploring underwater islands. One of these, Cordell Bank, became a national marine sanctuary, and another was eventually named Schmieder Bank. I took expeditions to some famous places, including Peter I Island and Heard Island in Antarctica, Easter Island, and Kure Atoll (at the end of the Hawaiian Island chain). On these expeditions we discovered many new species of organisms; three animals and one plant that we discovered were named after me.

I like to write, and so far I have published about 100 technical papers and fourteen books, including one for each of my grandchildren. All this is well and good, but perhaps you'll discover, as I did, that life is mostly about family and friends, and that's what this book is about.

Acknowledgements

The author wishes to extend to his daughter Robyn sincere appreciation for her help in the concept and organization of this book. He is also grateful to his wife Kay for helpful discussions on its development and completion.

The CD

The CD included with this book contains the electronic version of the book itself, and also various documents, pictures, and other material about tiny animals.

Publication information

This book was printed on acid-free paper. It is set in Tempus Sans ITC (titles) and New Century Schoolbook (text). It was composed in late 2010 as a Christmas present for Lisa. It was privately printed and bound. For further information, contact the author at: Dr. Robert Schmieder, 4295 Walnut Blvd., Walnut Creek, CA 94596, Robert@schmieder.com.

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