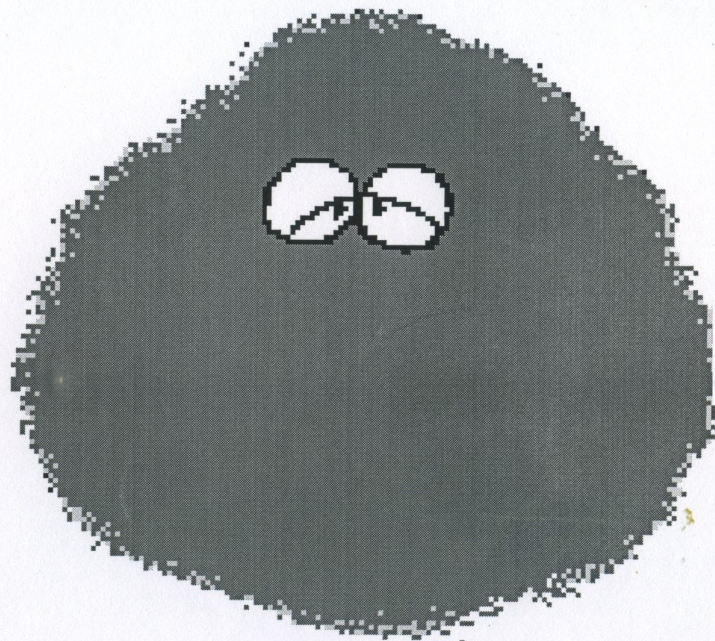


CHUNKY WANTS TO PLAY

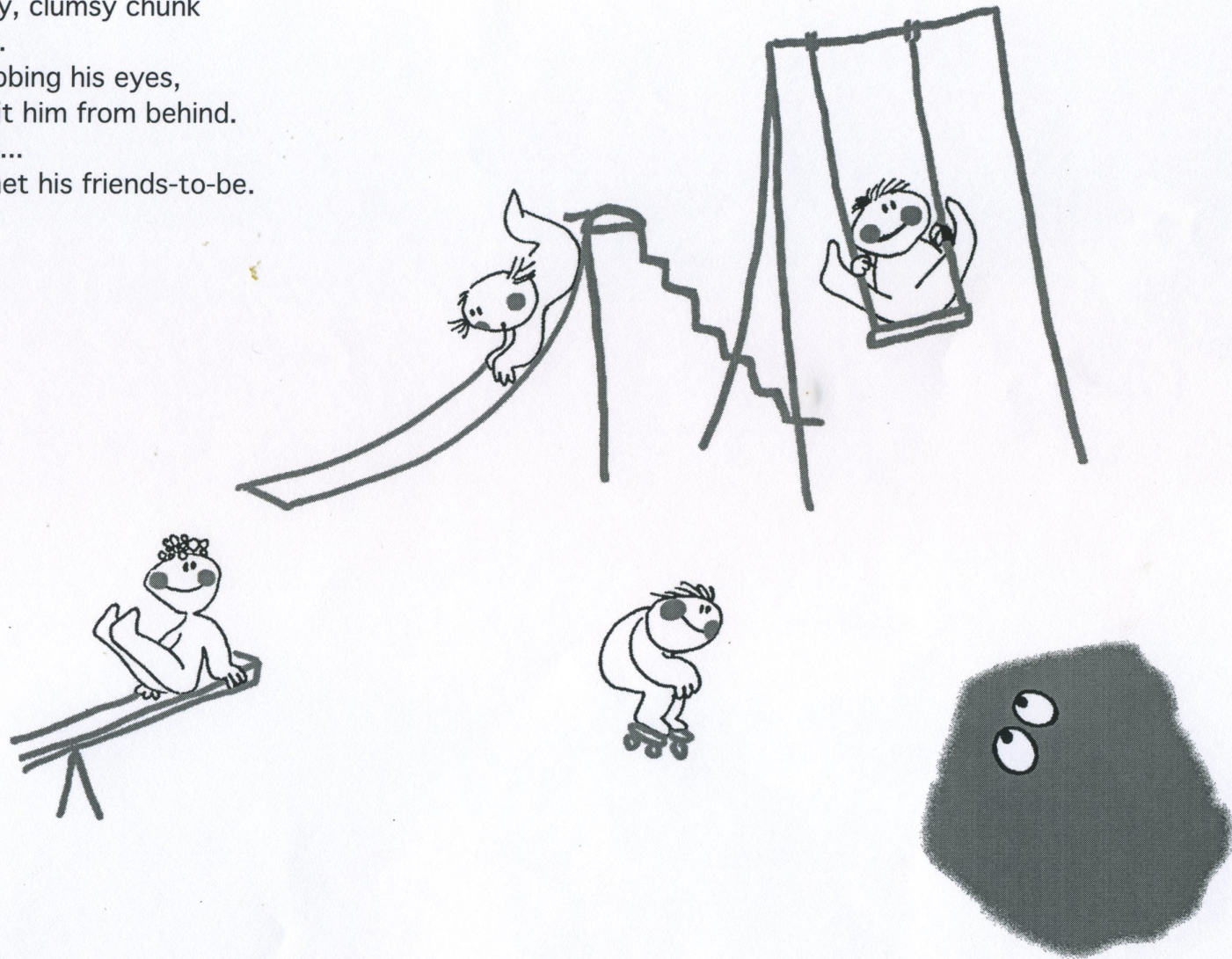
or THE DIFFERENCE BETWEEN WEIGHT AND MASS



By Dr. Gideon Carmi

Illustrated by Chanan Kaminsky

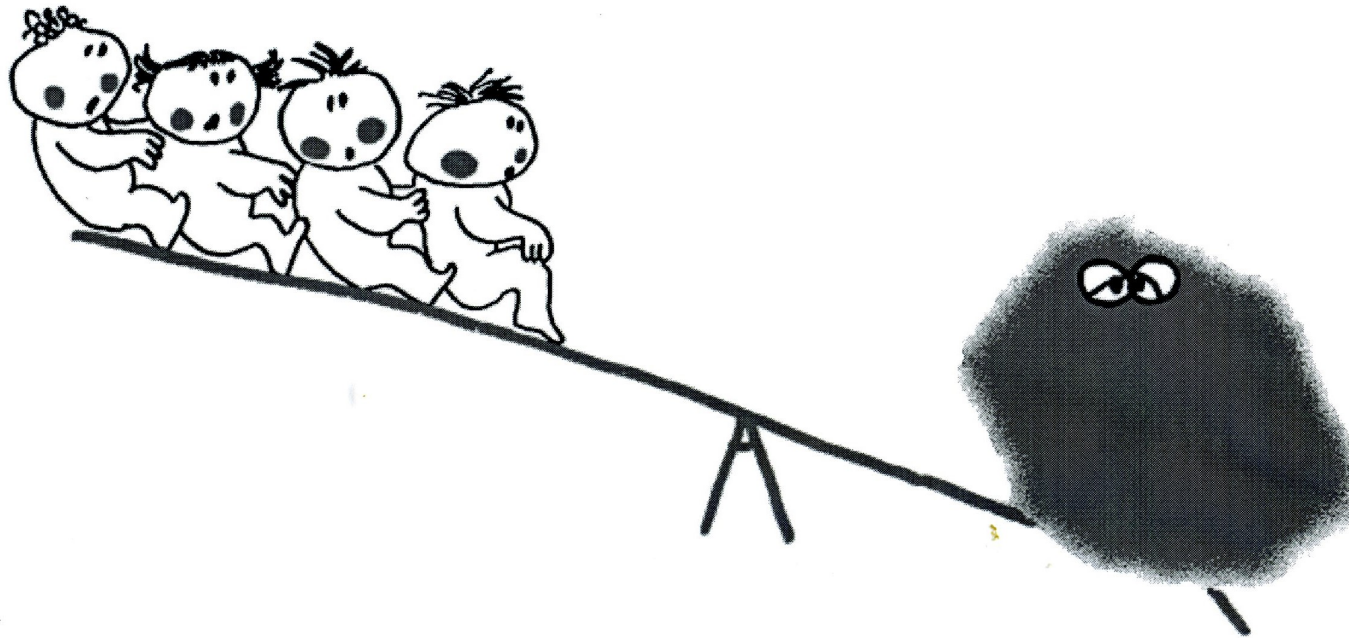
It was a fine, clear day.
Suddenly, a big, heavy, clumsy chunk
fell from Outer Space.
He stood on Earth rubbing his eyes,
when THUD... a ball hit him from behind.
he turned around and...
Well, that's how he met his friends-to-be.



“Hey you there, come play with us!”
“What’s your name?”
“We’ll call you Chunky!”



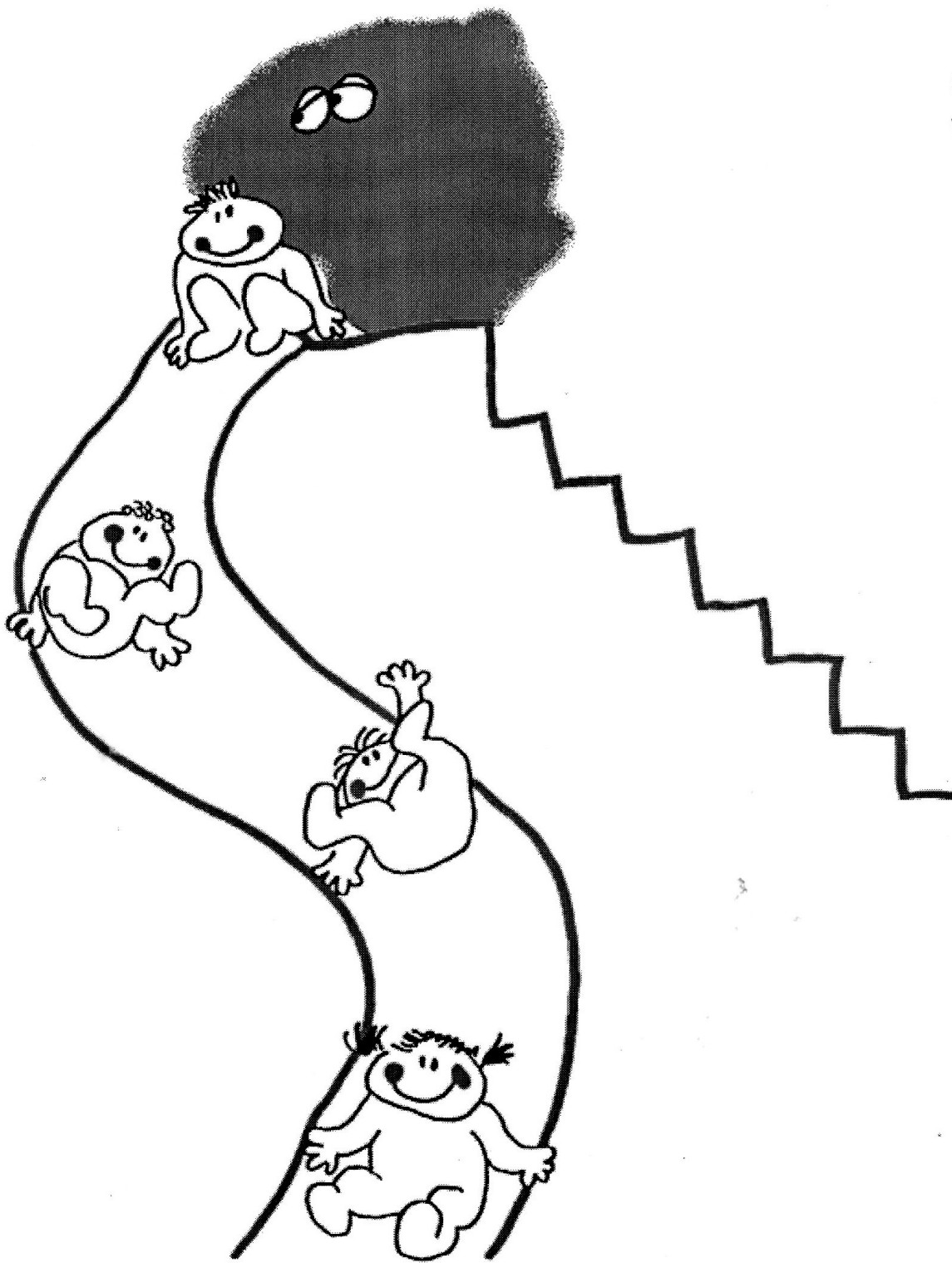
“Chunky, Chun-ky! What do you think you’re doing? We’re supposed to go up-and-down!”



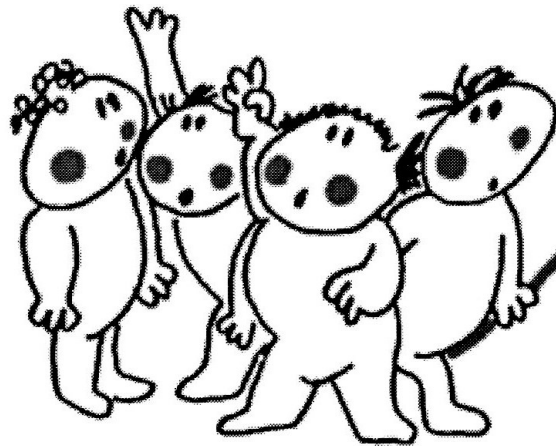
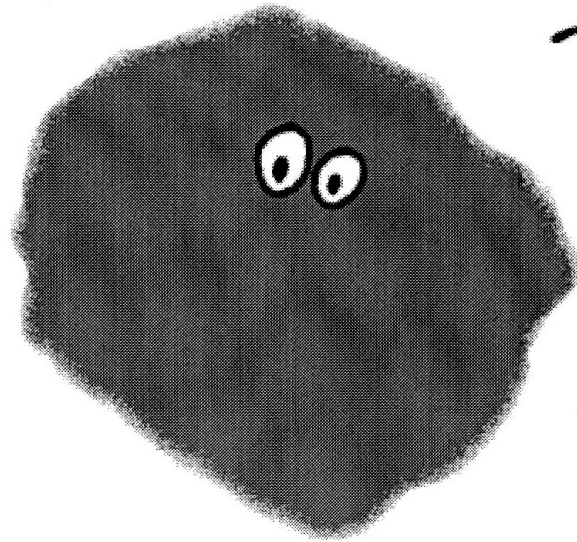


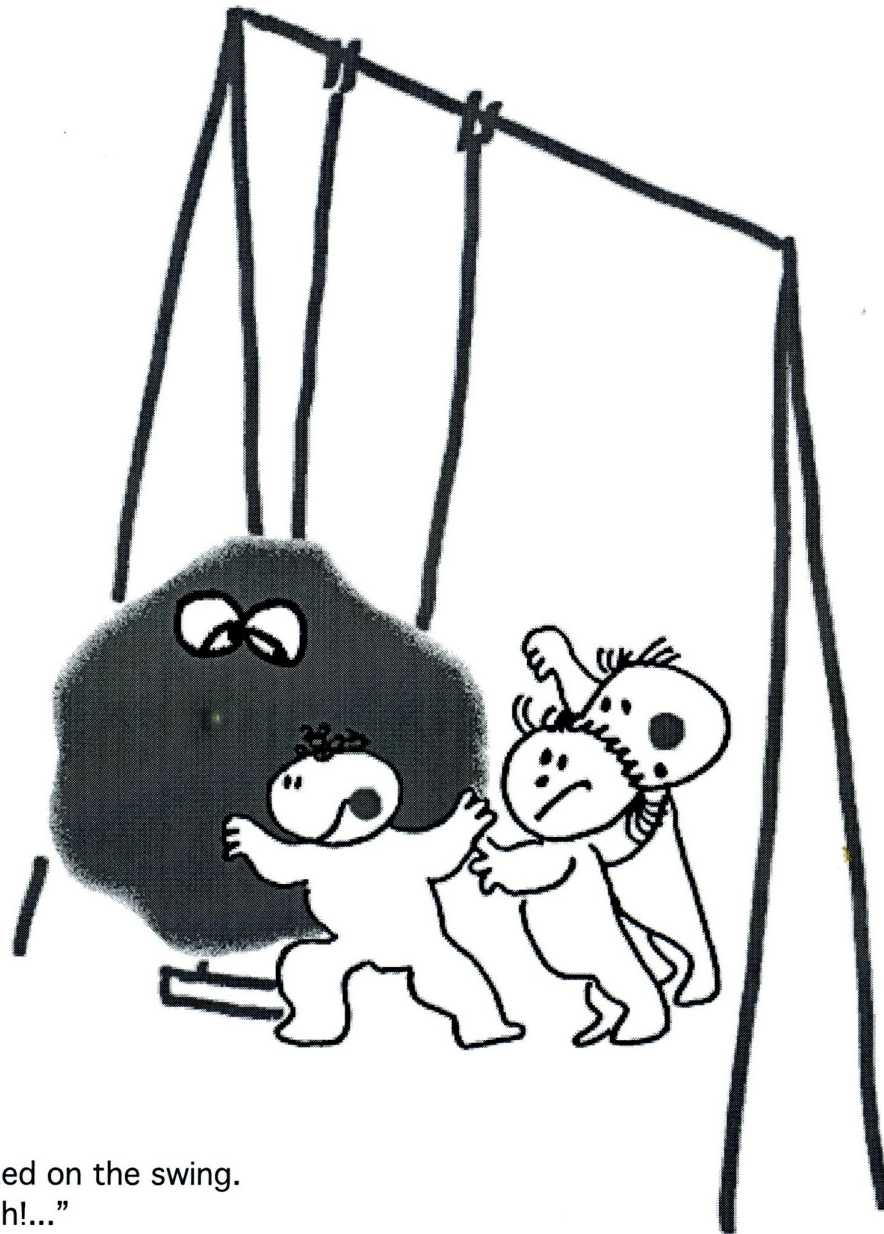
“Okay – everybody together now – 1, 2, 3... push!
Keep on going 'til we get him to the top of the slide.
...1, 2, 3... push!...”

Chunky sat patiently
waiting for his turn.

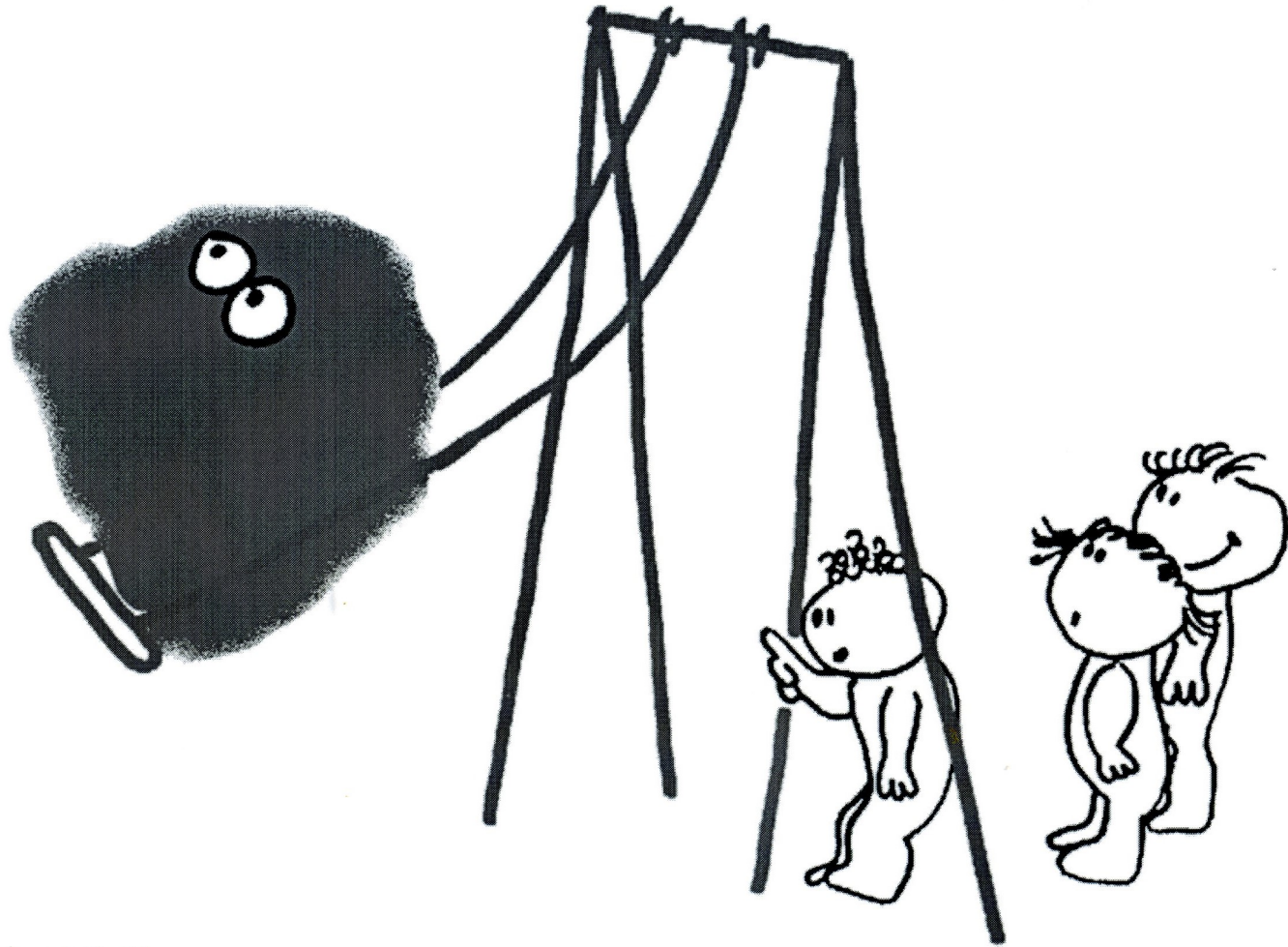


“Yikes! Chunky’s slipping off the slide!”



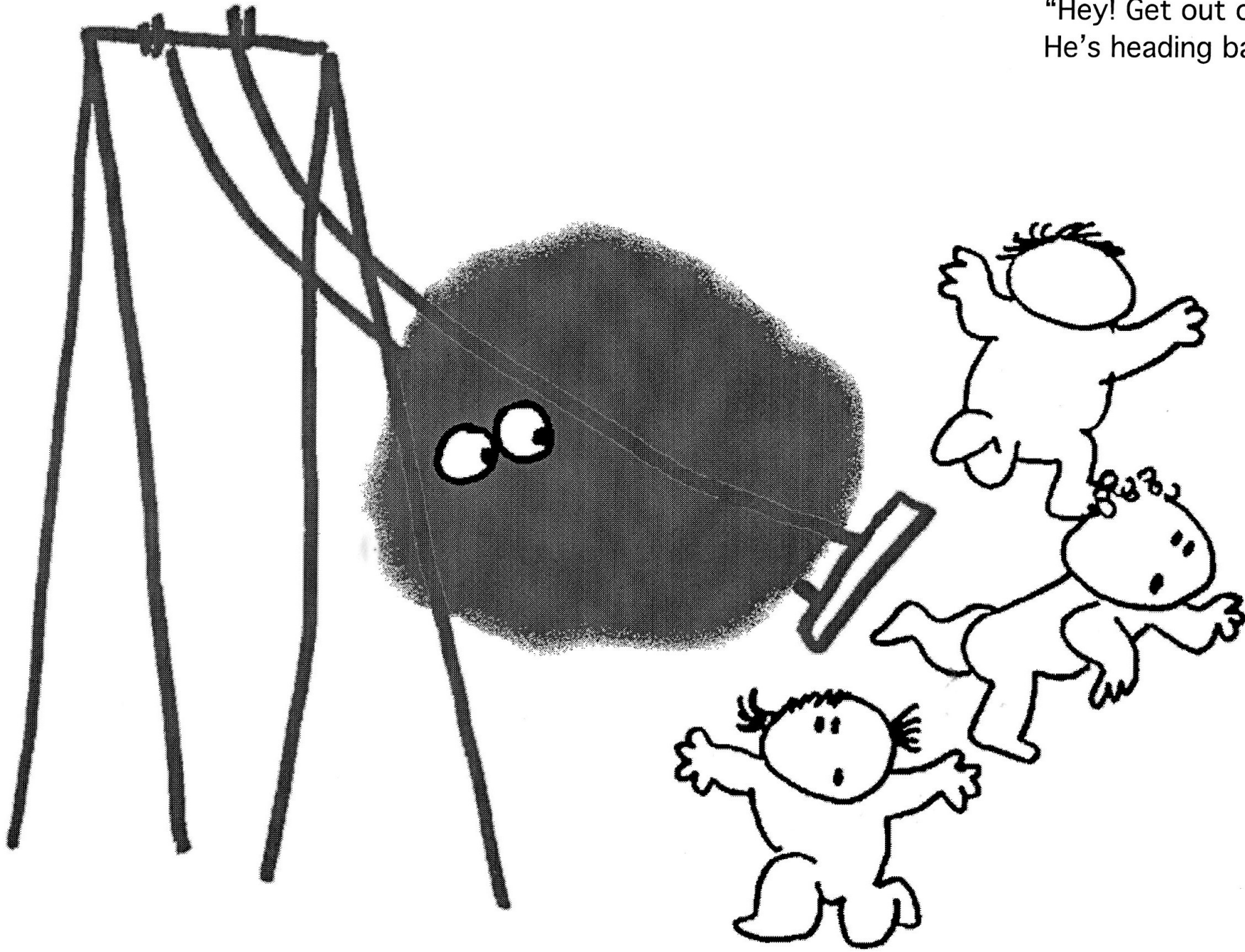


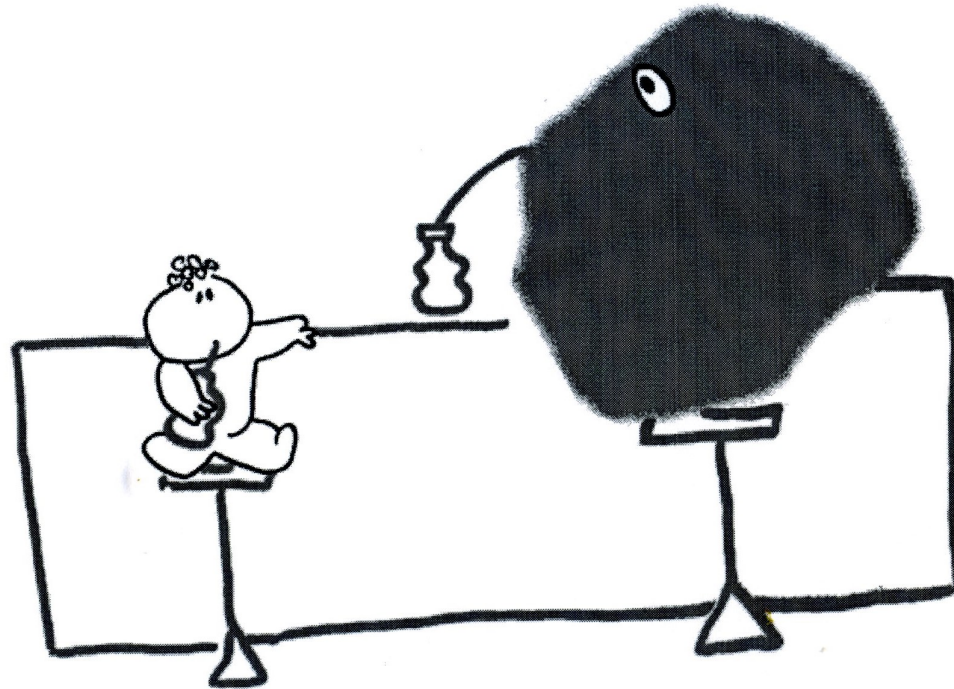
“Okay – let’s get him started on the swing.
All together... Ready... Push!...”



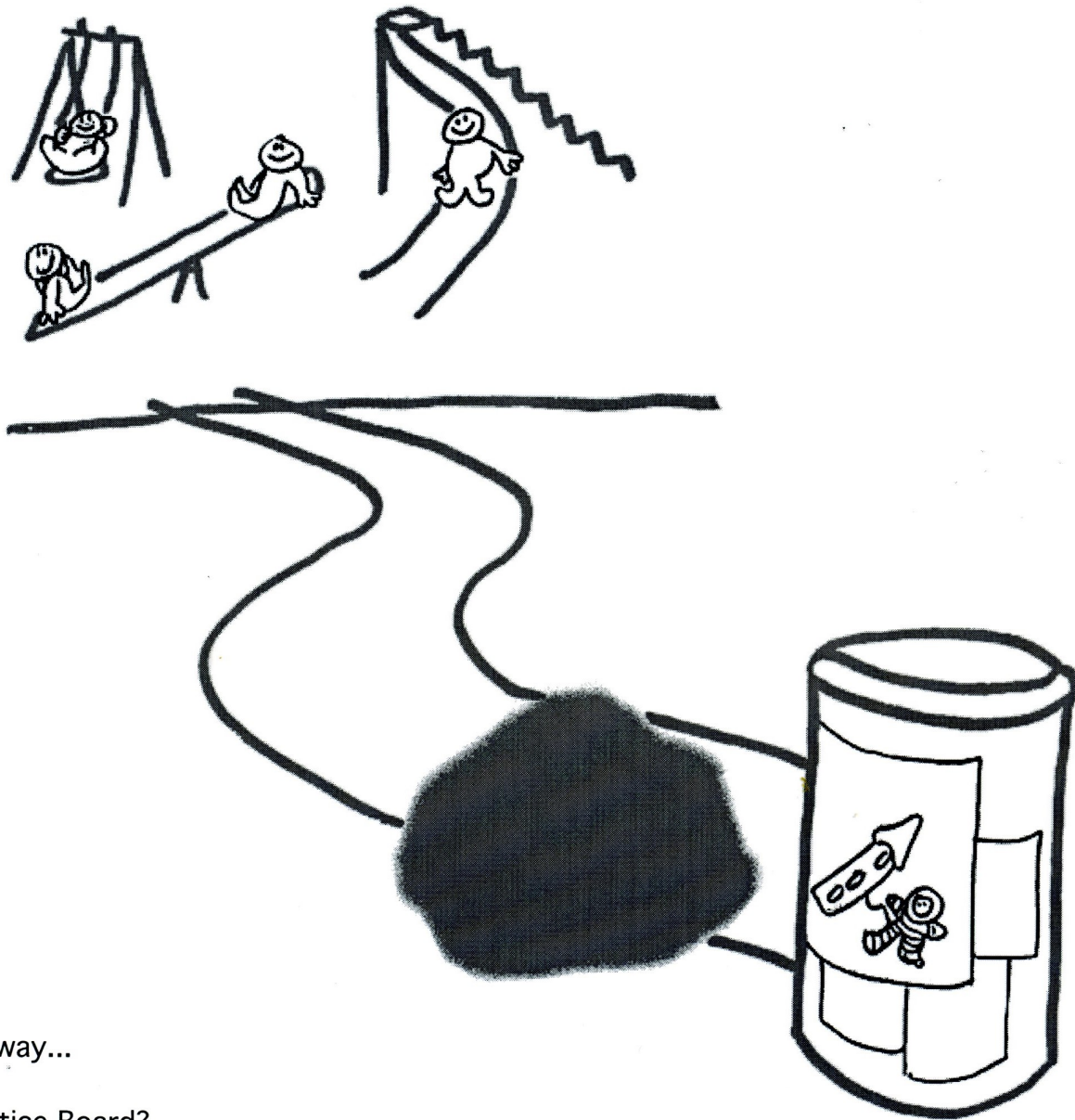
“Hey, how about that!
We did it!”

But... but...
“Hey! Get out of the way!
He’s heading back this way!”

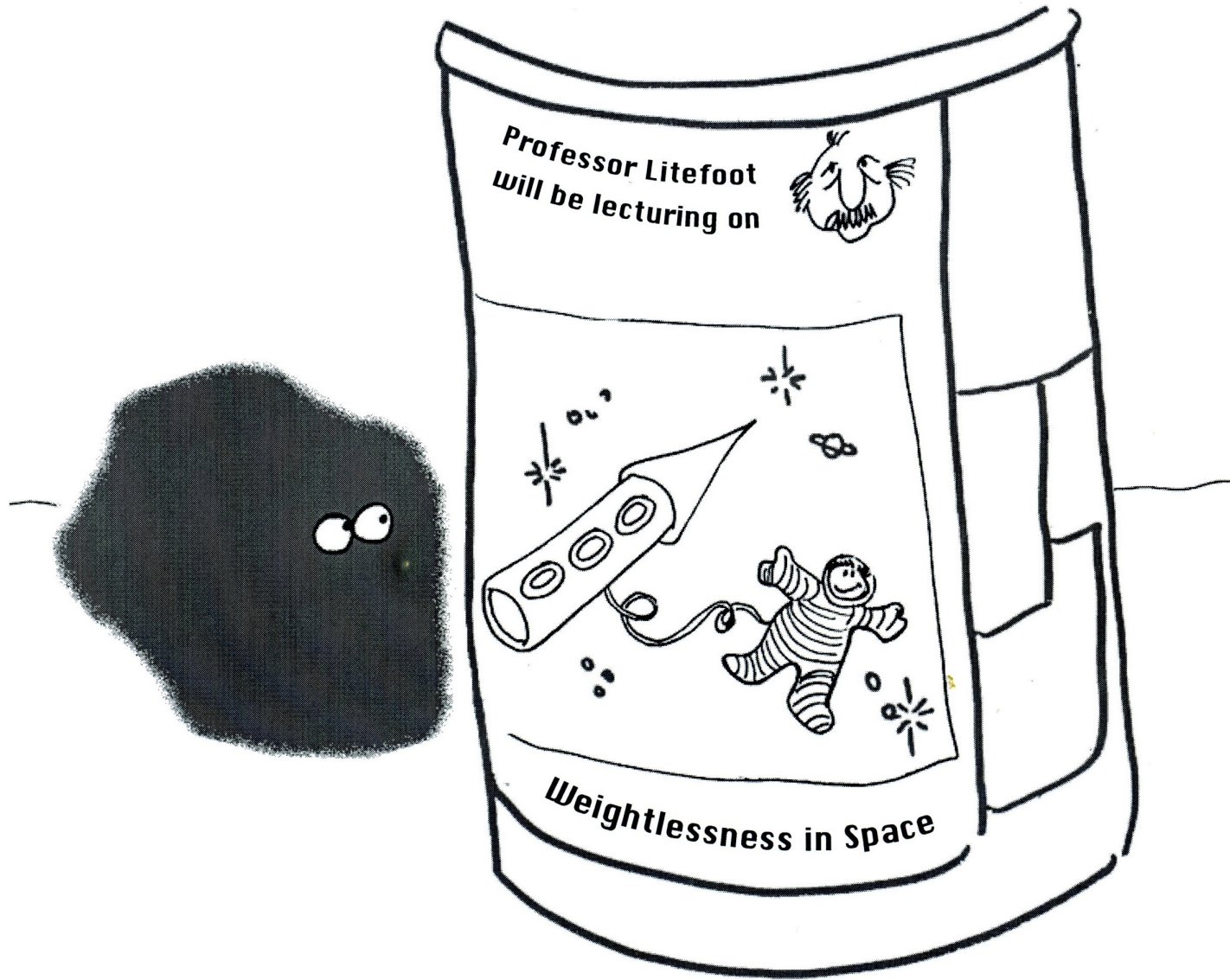


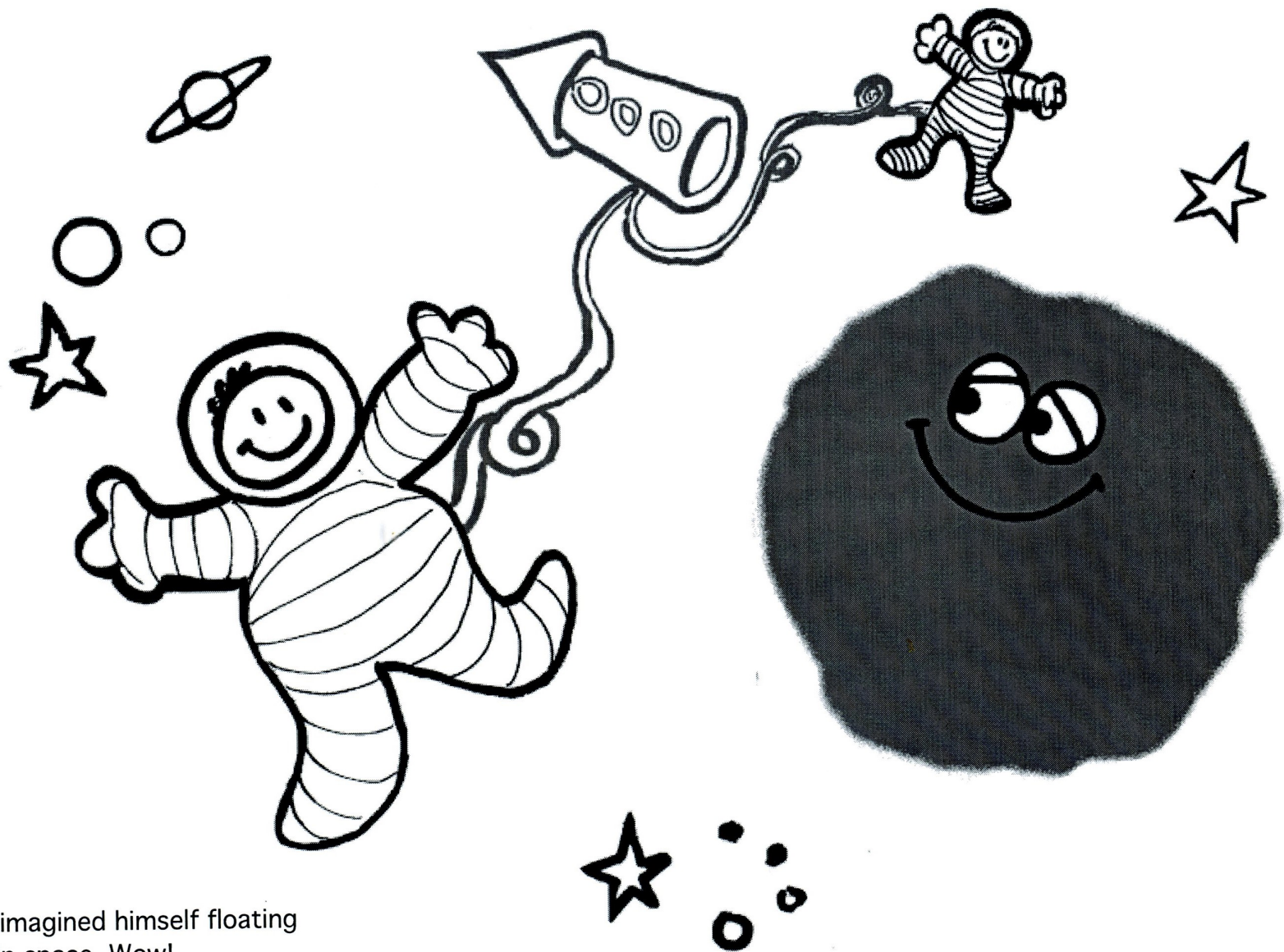


“Chunky, pal, rest awhile.”
Chunky was in fact, a little out of breath.
Maybe he just wasn’t the playground type.



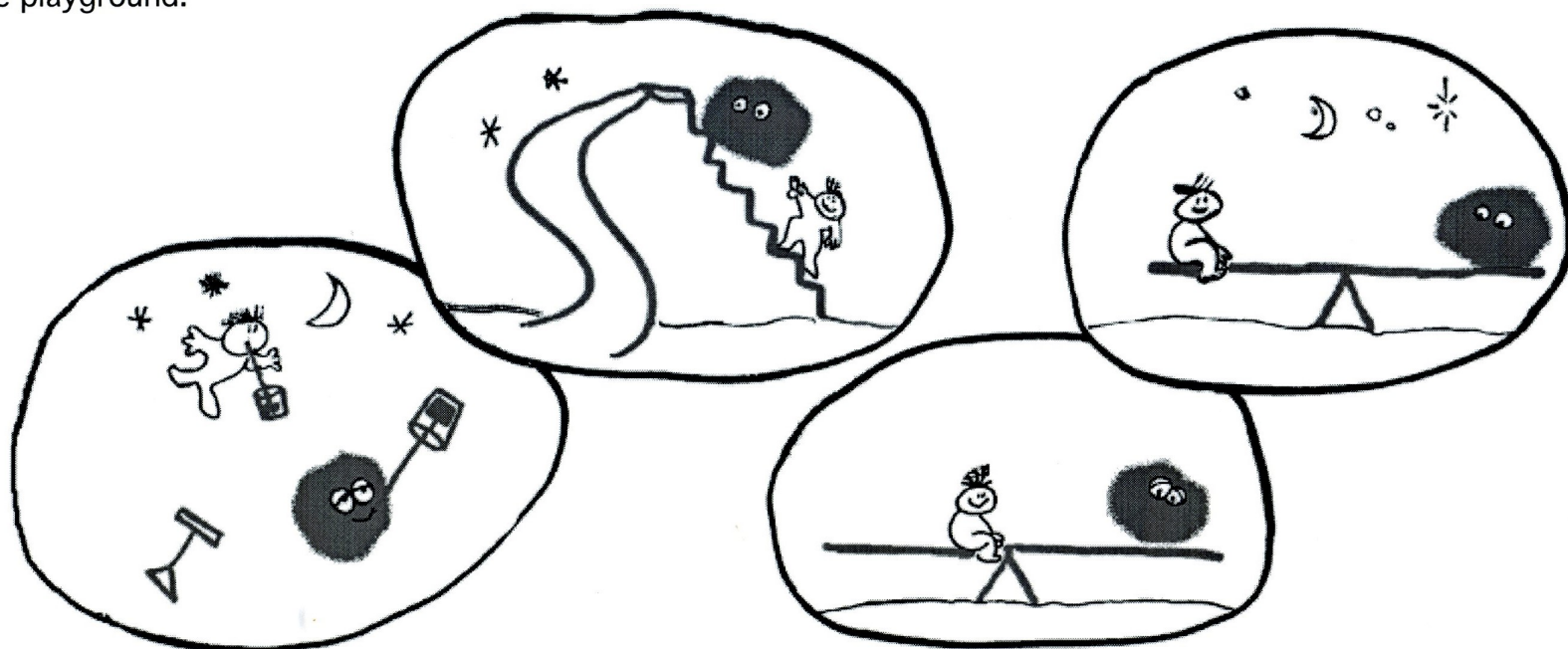
He felt sad as he rolled away...
But... wait a minute!
What was that on the Notice Board?





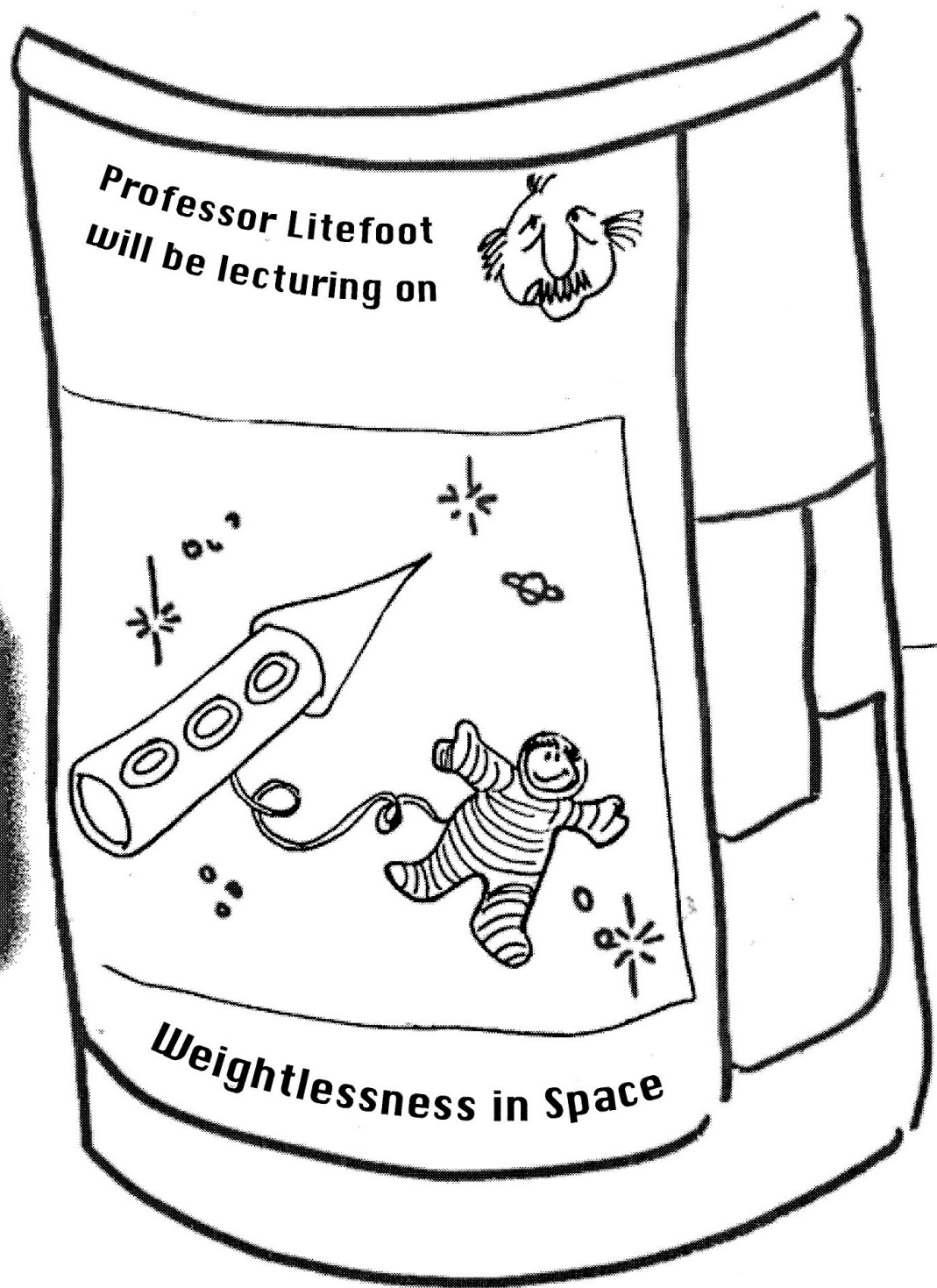
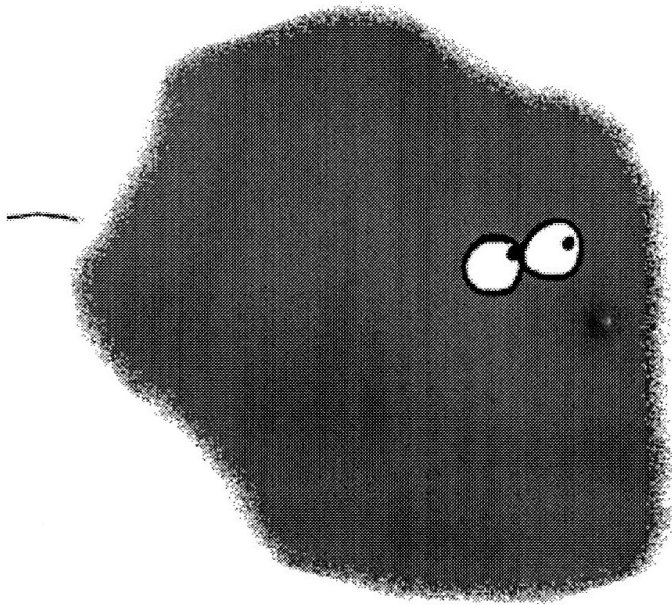
Chunky imagined himself floating around in space. Wow!

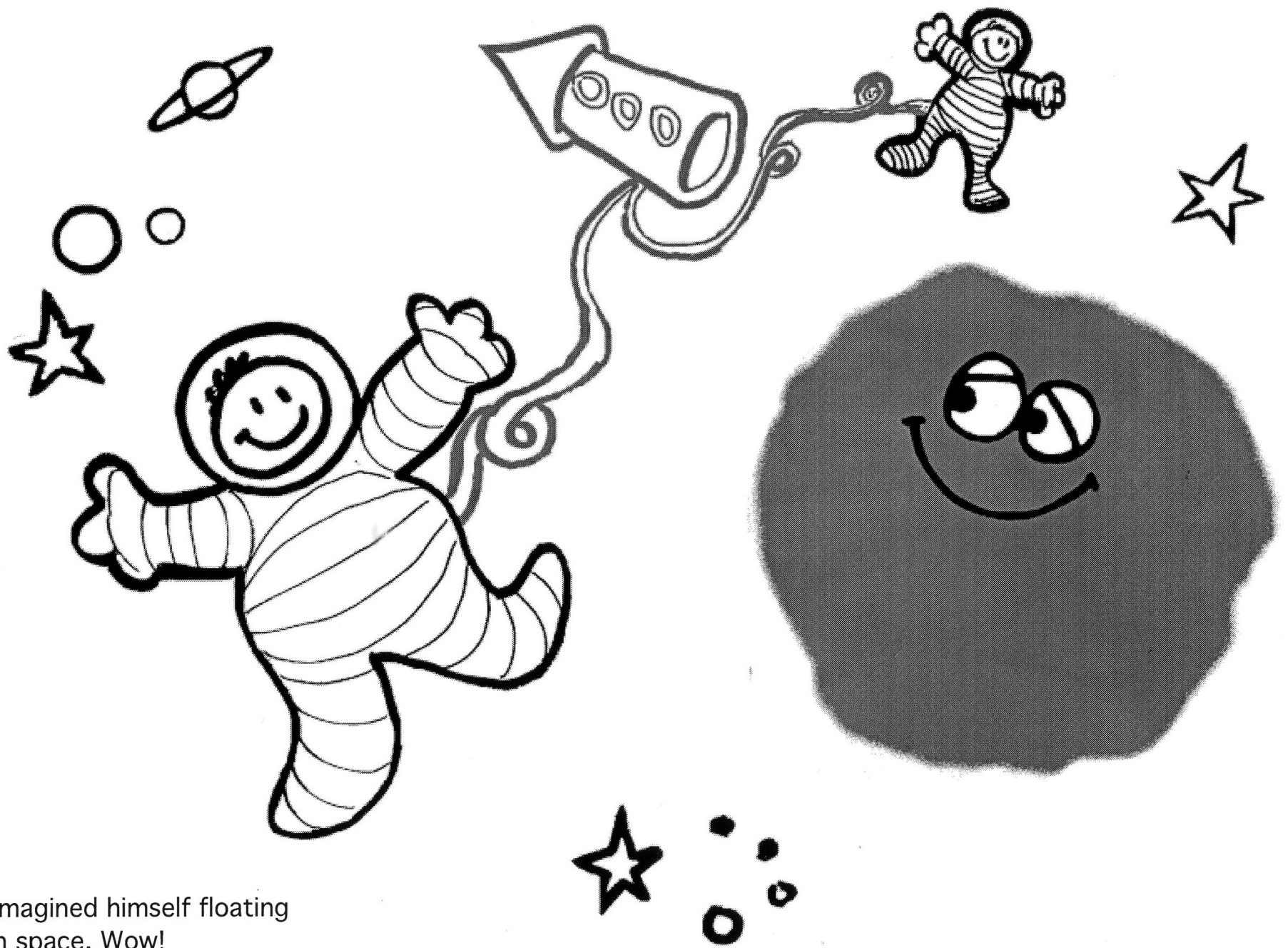
Feeling much better, he returned to the playground.



“Hey, you know what?
There’s a place where even I
could float on the water with-
out any support; a place where
just one of you could lift me, or
balance me on the see-saw
even if you sat near the middle!”

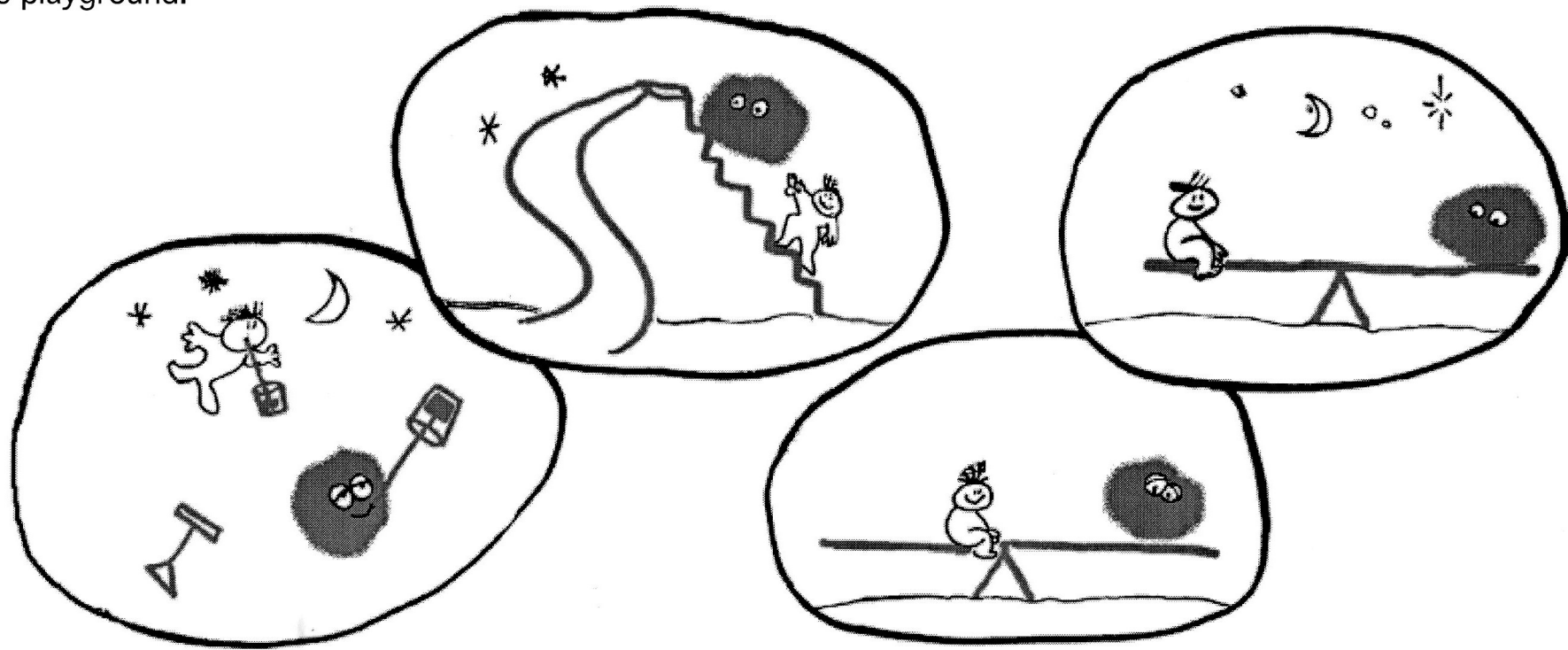






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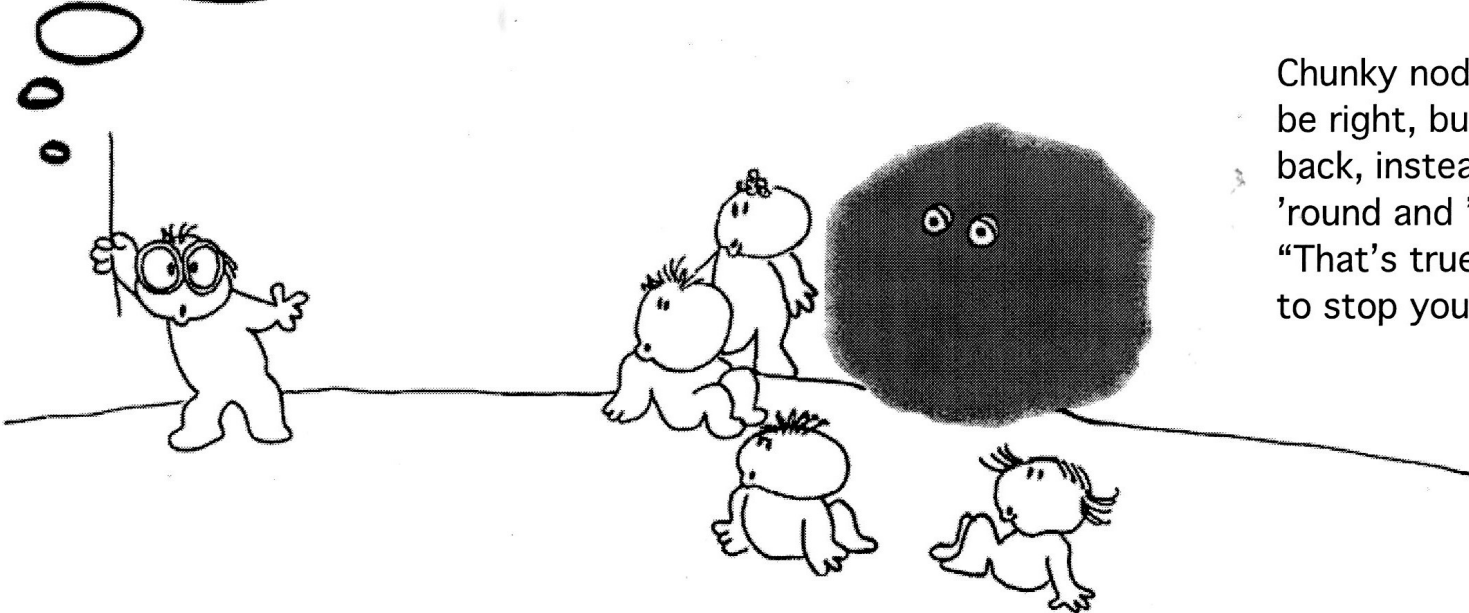
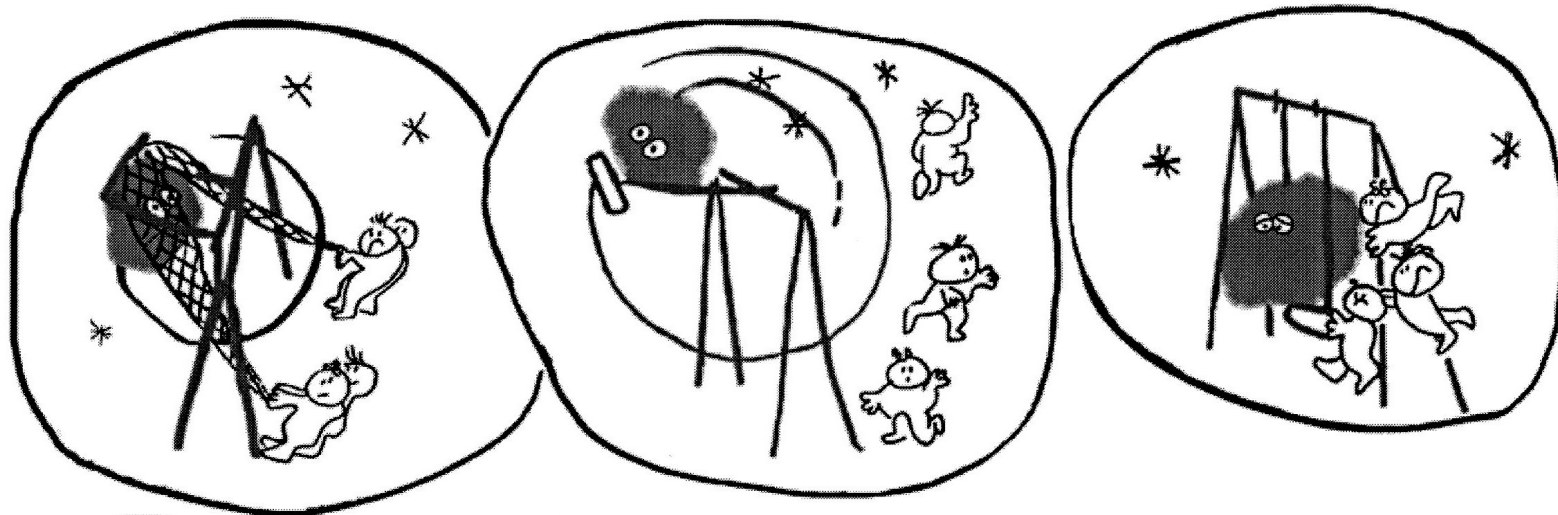
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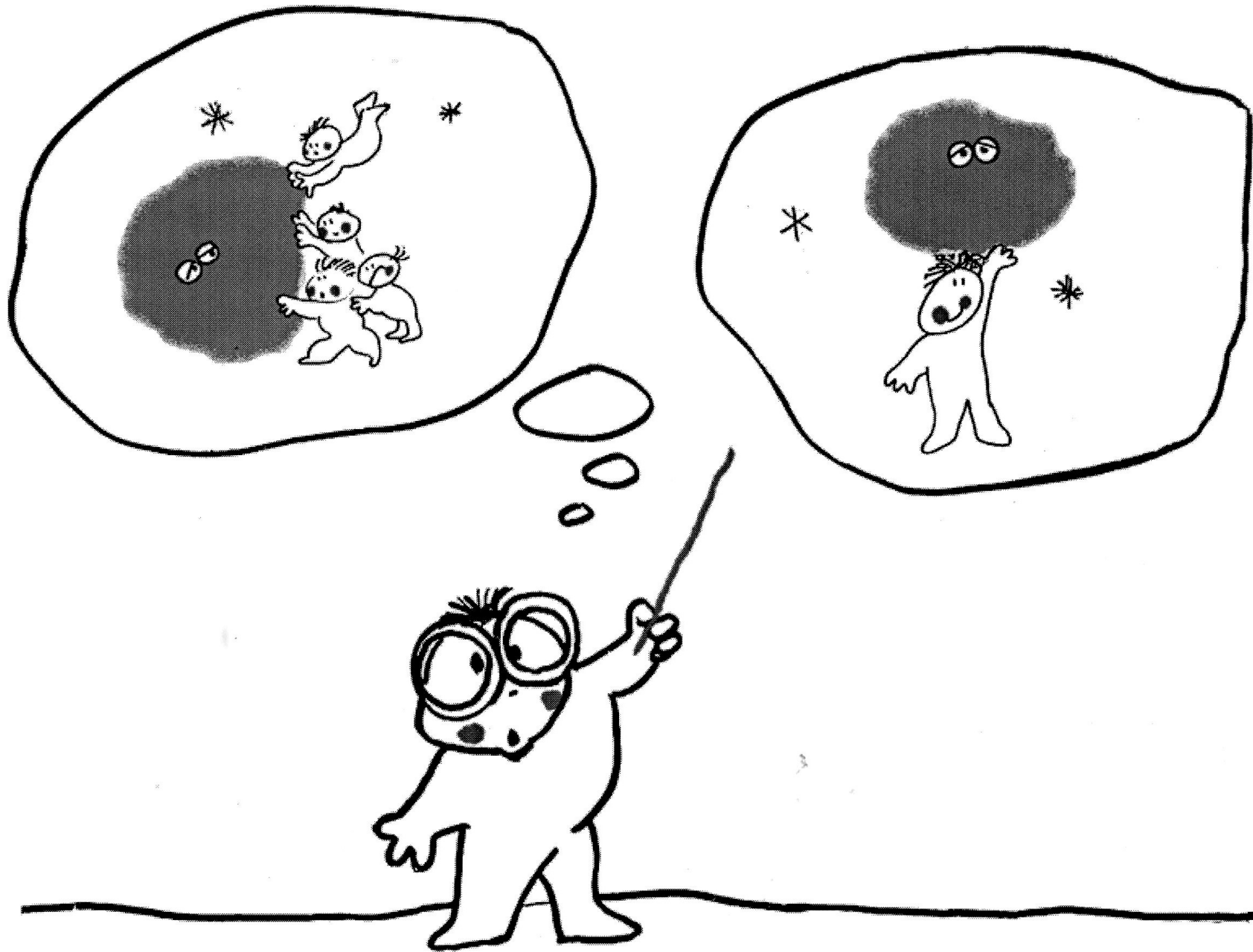
“Hey, you know what?
There’s a place where even I
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out any support; a place where
just one of you could lift me, or
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even if you sat near the middle!



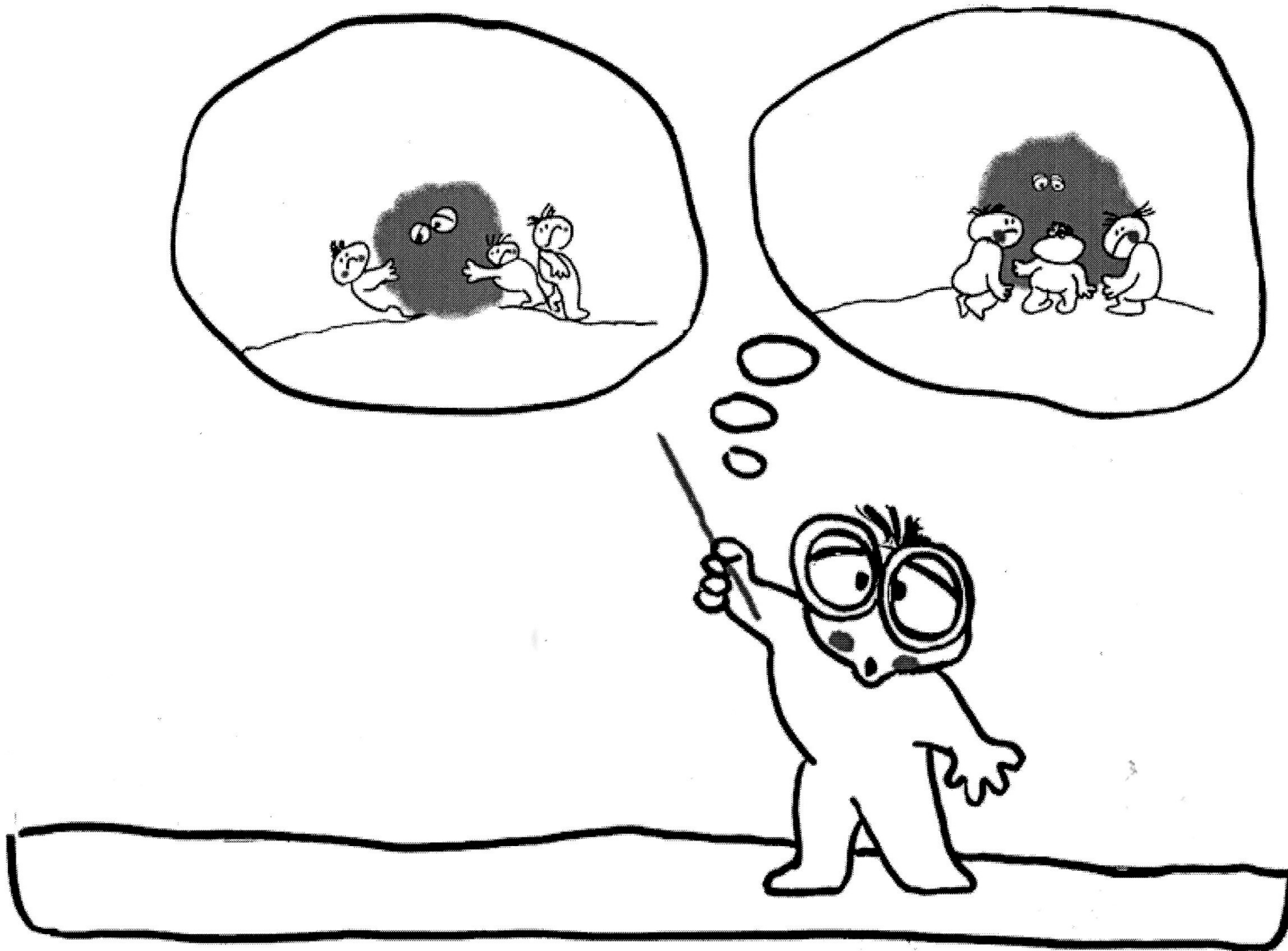
But as you know, there's always a wise-guy in every playground. He just looked at Chunky for a while and then said: "Yes, all that is true of course... but that has to do with your weight. Now listen Chunky, if you wanted to swing, you'd still need all of us to push you."



Chunky nodded, "Yeah, you could be right, but I wouldn't swing back, instead I'd go on turning 'round and 'round endlessly."
"That's true. But if you wanted to stop you'd need us again."



“You see, Chunky, in Space you’d weigh zero, but your mass stays the same wherever you go!”



“However, here on planet Earth, you’ll always have both – weight and mass.”

Chunky thought he'd better go to that "Weightlessness" talk by Professor Litefoot. There were a few things he needed to clear up.

So, he sat down and listened and listened and...
before he knew it, he fell asleep, snoring loudly.

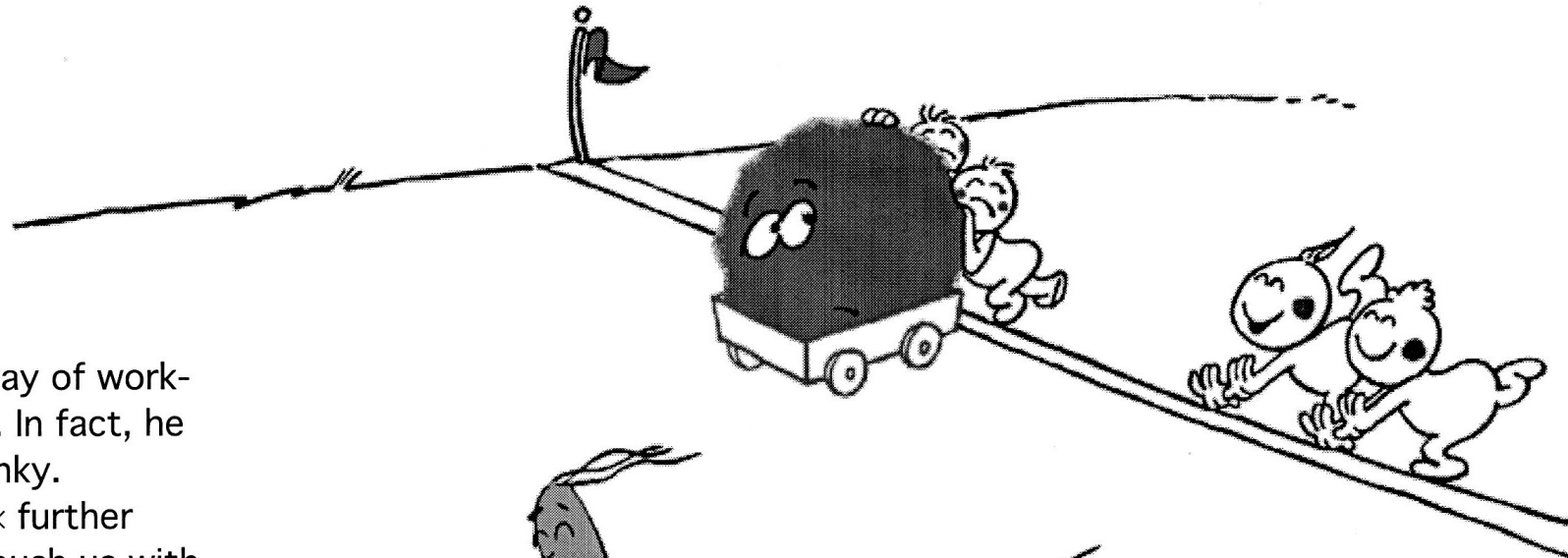
“Wake up, wake up! Goodness, who are you!”
Chunky opened his eyes and saw a funny face
very close to his own. “Who are **you**?”

“Why I’m Litefoot, of course.
So glad to meet you, but who are you?”

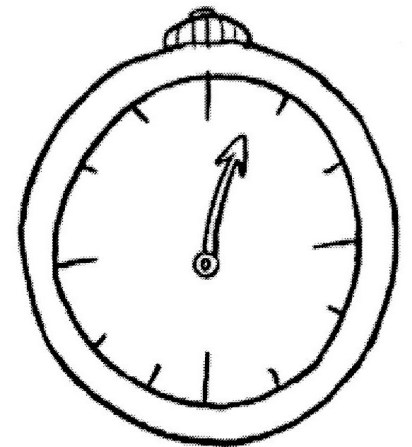
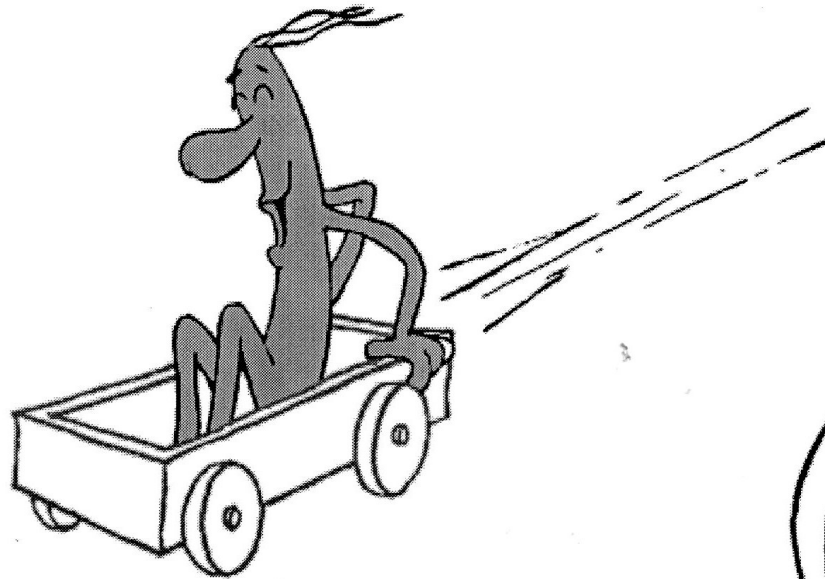
“Name’s Chunky.”

Litefoot was thrilled when he heard Chunky’s history and decided then and there to make Chunky his assistant.

DR. LITEFOOT HAS FUN WITH CHUNKY

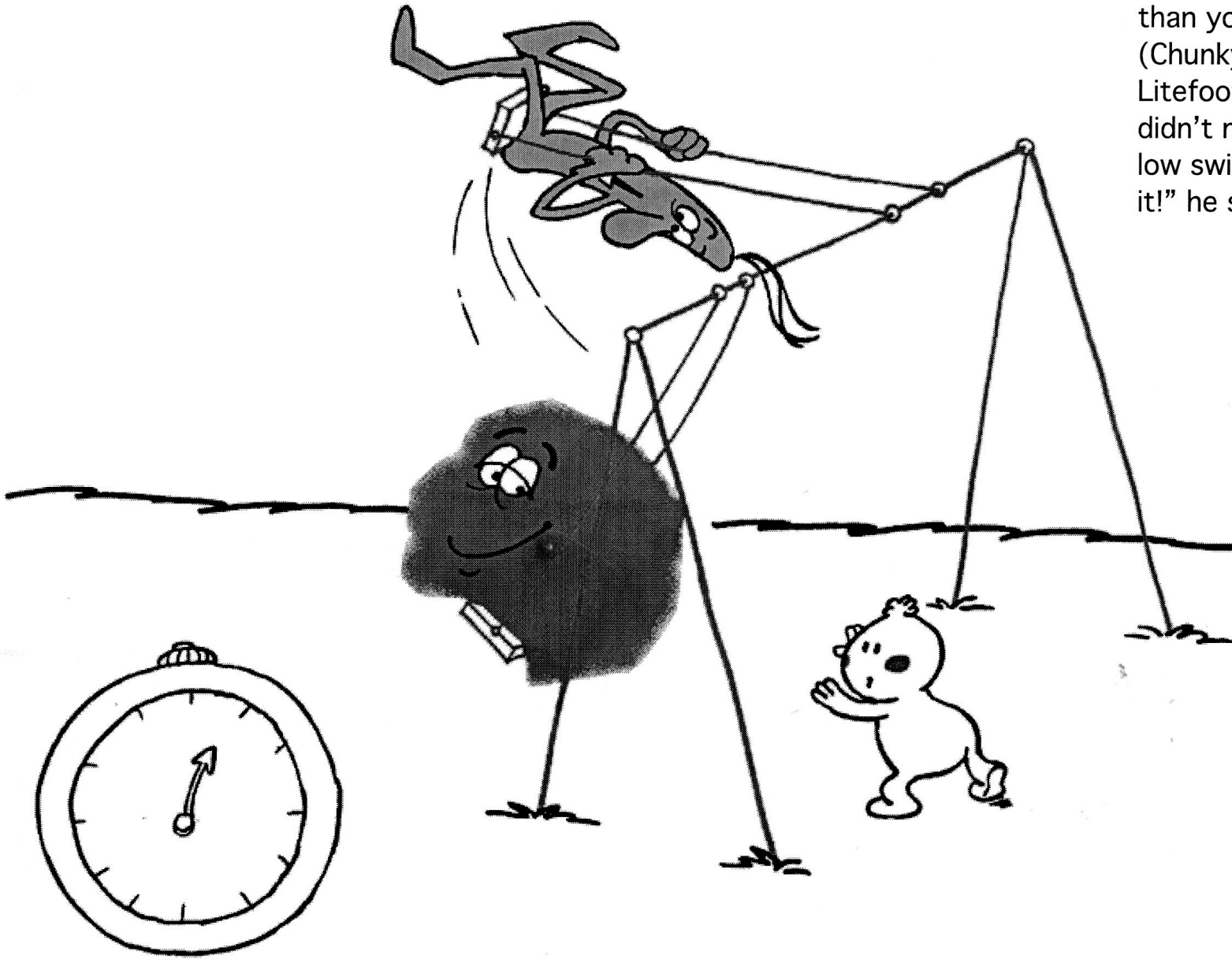


Litefoot had a strange way of working. He liked to have fun. In fact, he loved making fun of Chunky. "Let's bet that I'll get 6× further than you when the kids push us with exactly the same force."



(Newton's 2nd Law: The distance that it takes for a mass to stop lies in opposite relation to the mass that is pushed.)

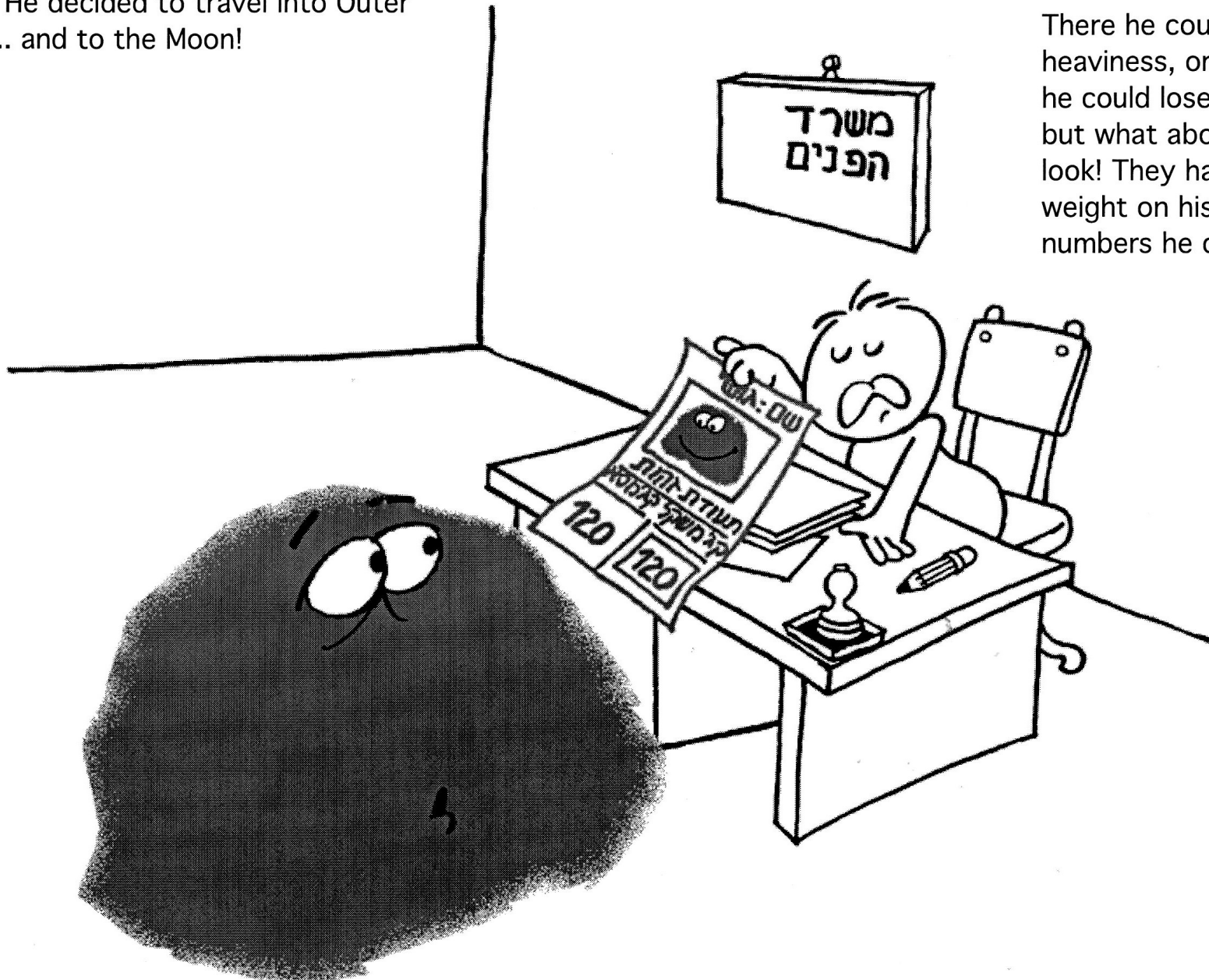
Dr. Litefoot wanted to bet again. "I'll bet that I can swing 6× higher than you can."
(Chunky was 6× heavier than Litefoot.) Guess who won? But it didn't matter, Chunky enjoyed his low swinging anyway. "Gentle does it!" he said to himself.



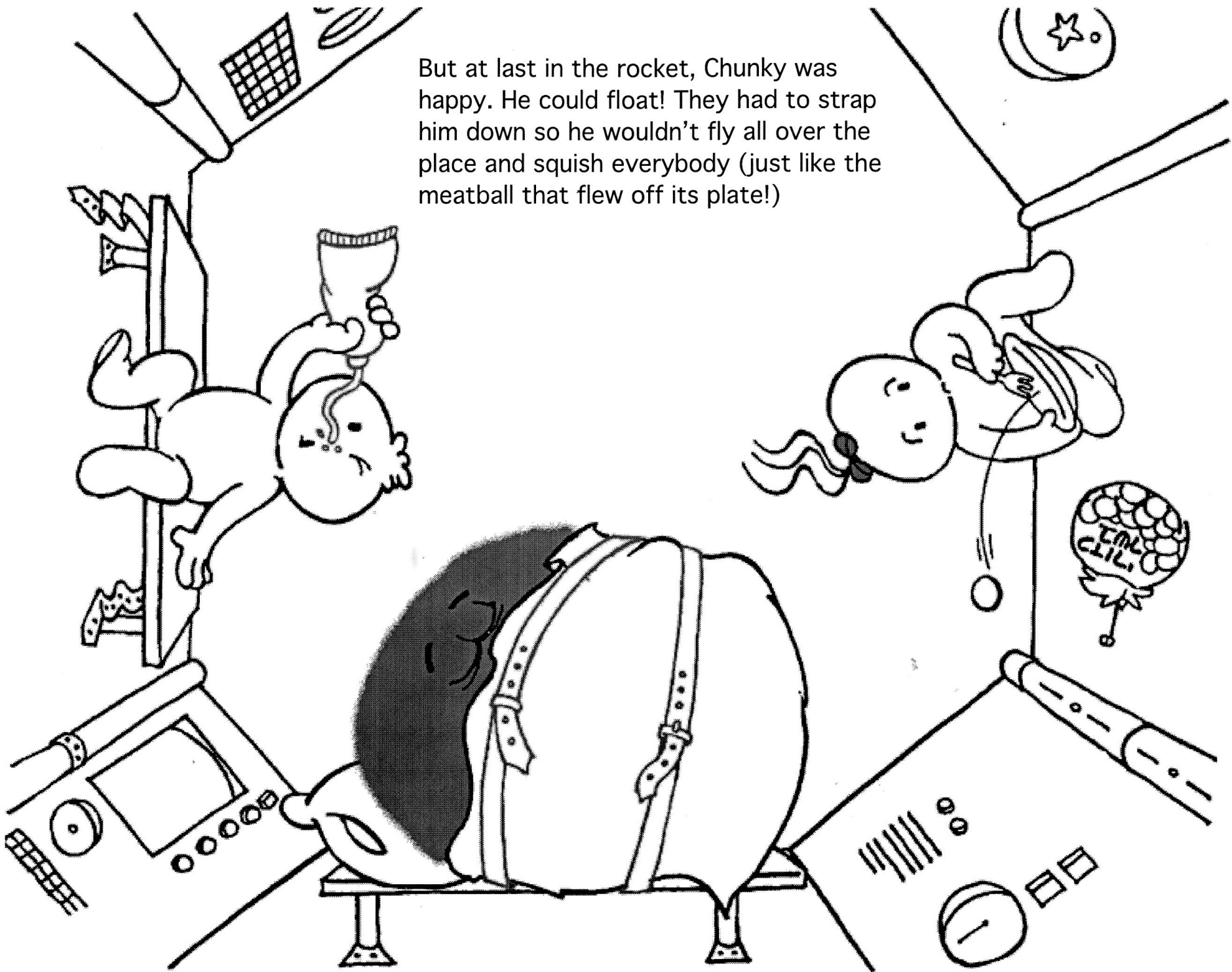
CHUNKY TAKES A TRIP

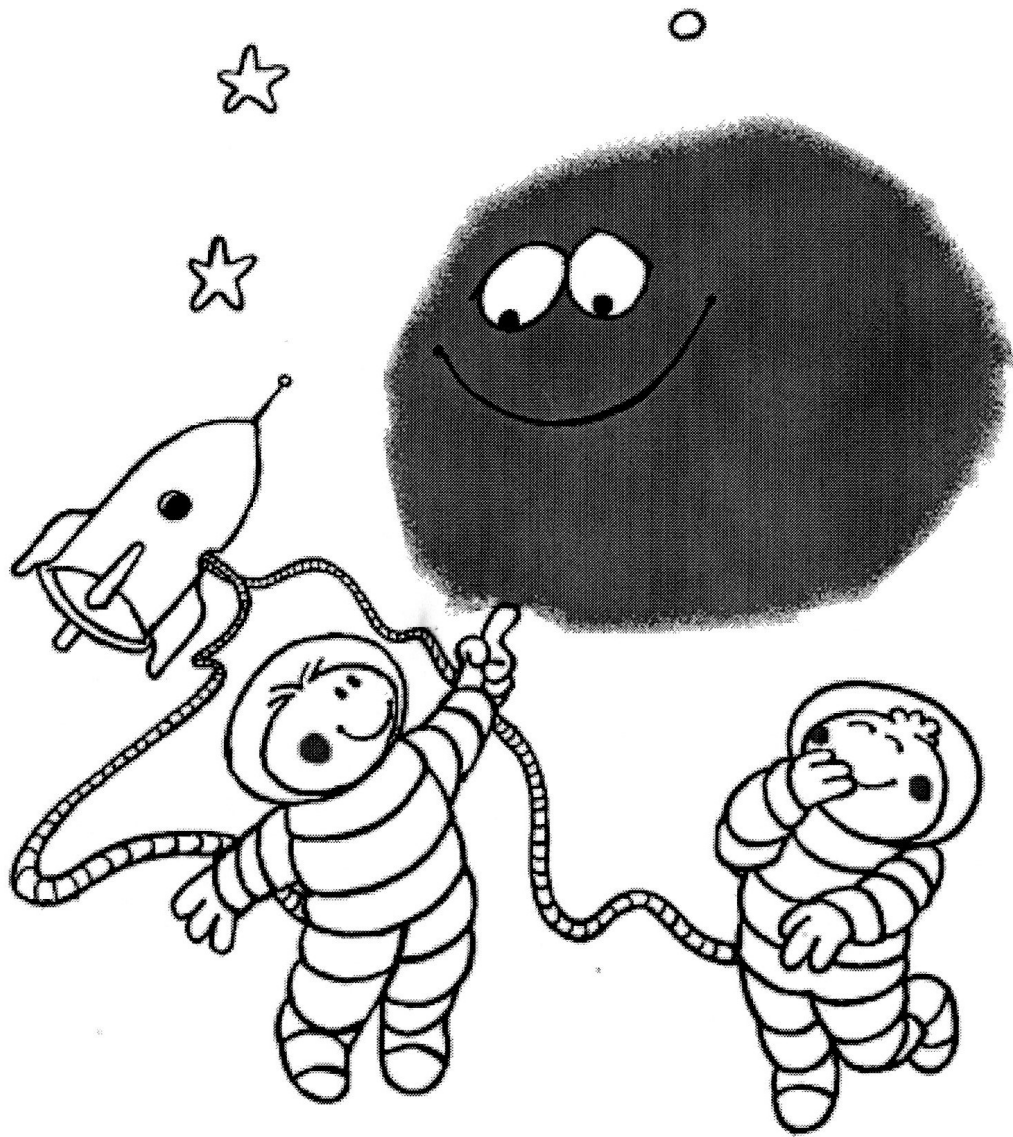
But Chunky had enough of being made fun of. He decided to travel into Outer Space... and to the Moon!

There he could forget about his heaviness, or could he? maybe he could lose some of his weight but what about his mass? Oh no, look! They had already printed his weight on his identity card with numbers he couldn't change!



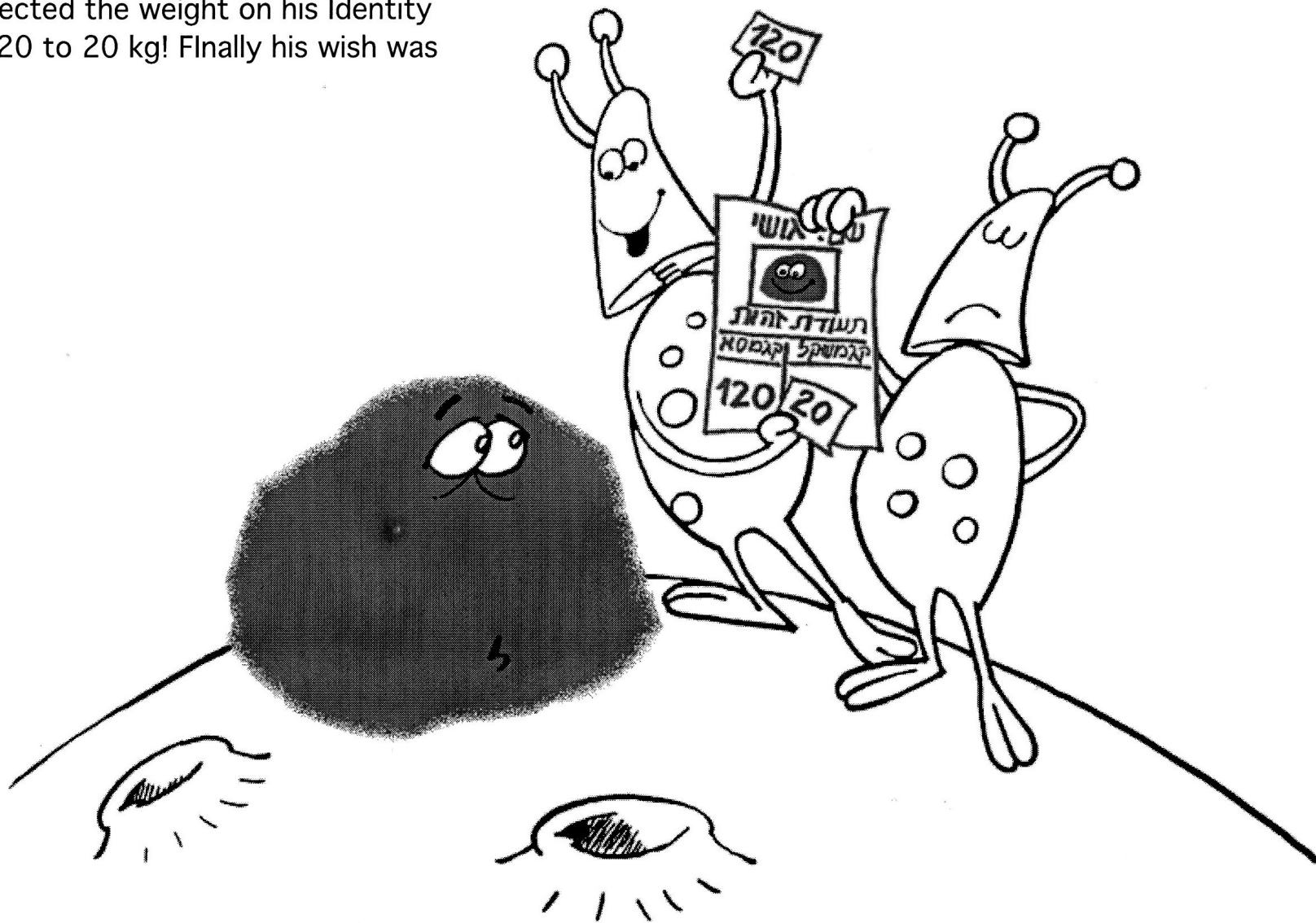
But at last in the rocket, Chunky was happy. He could float! They had to strap him down so he wouldn't fly all over the place and squish everybody (just like the meatball that flew off its plate!)

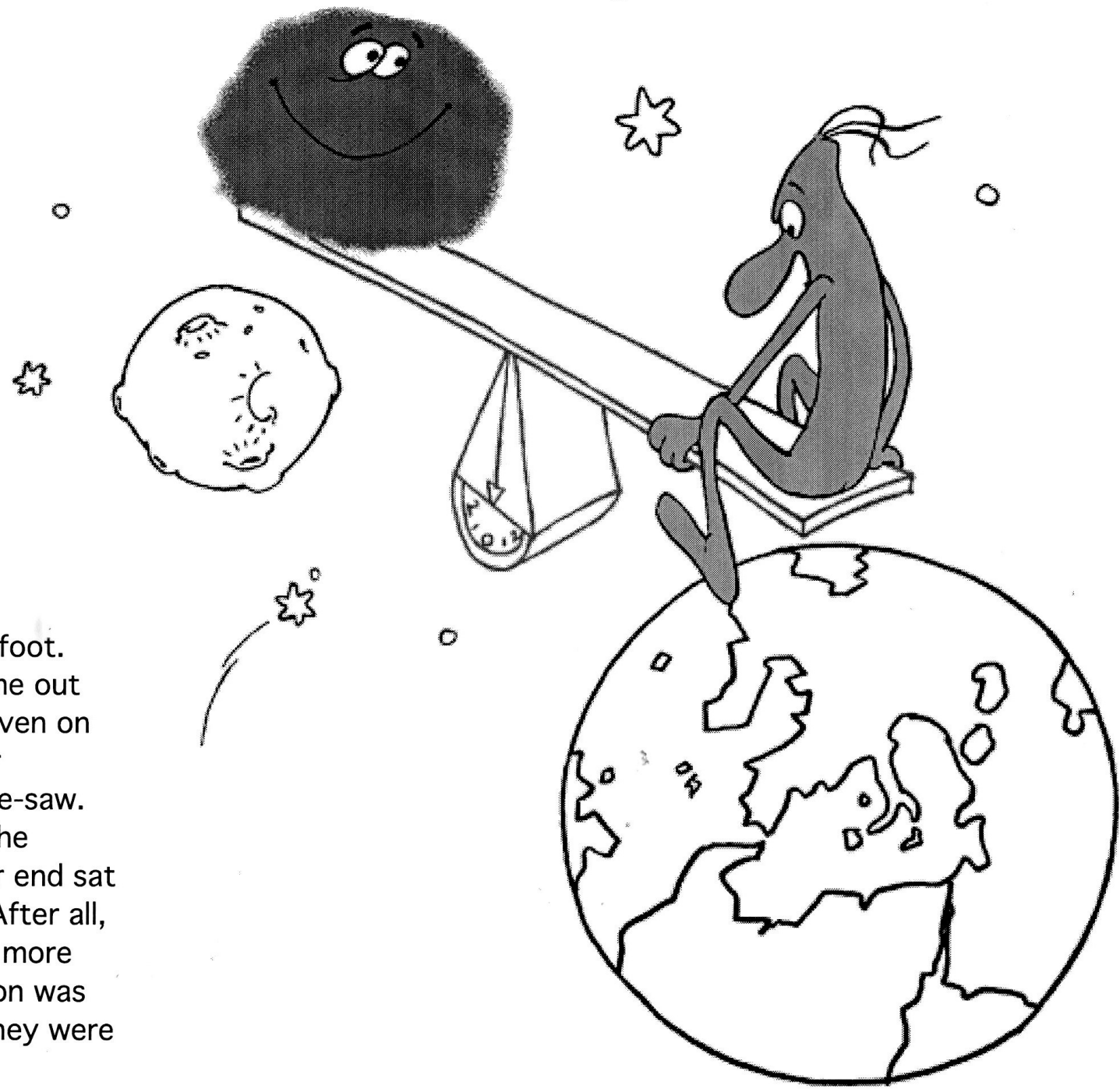




And when it was time to step out of the rocket, what fun it was to float around in Space, weightlessly!

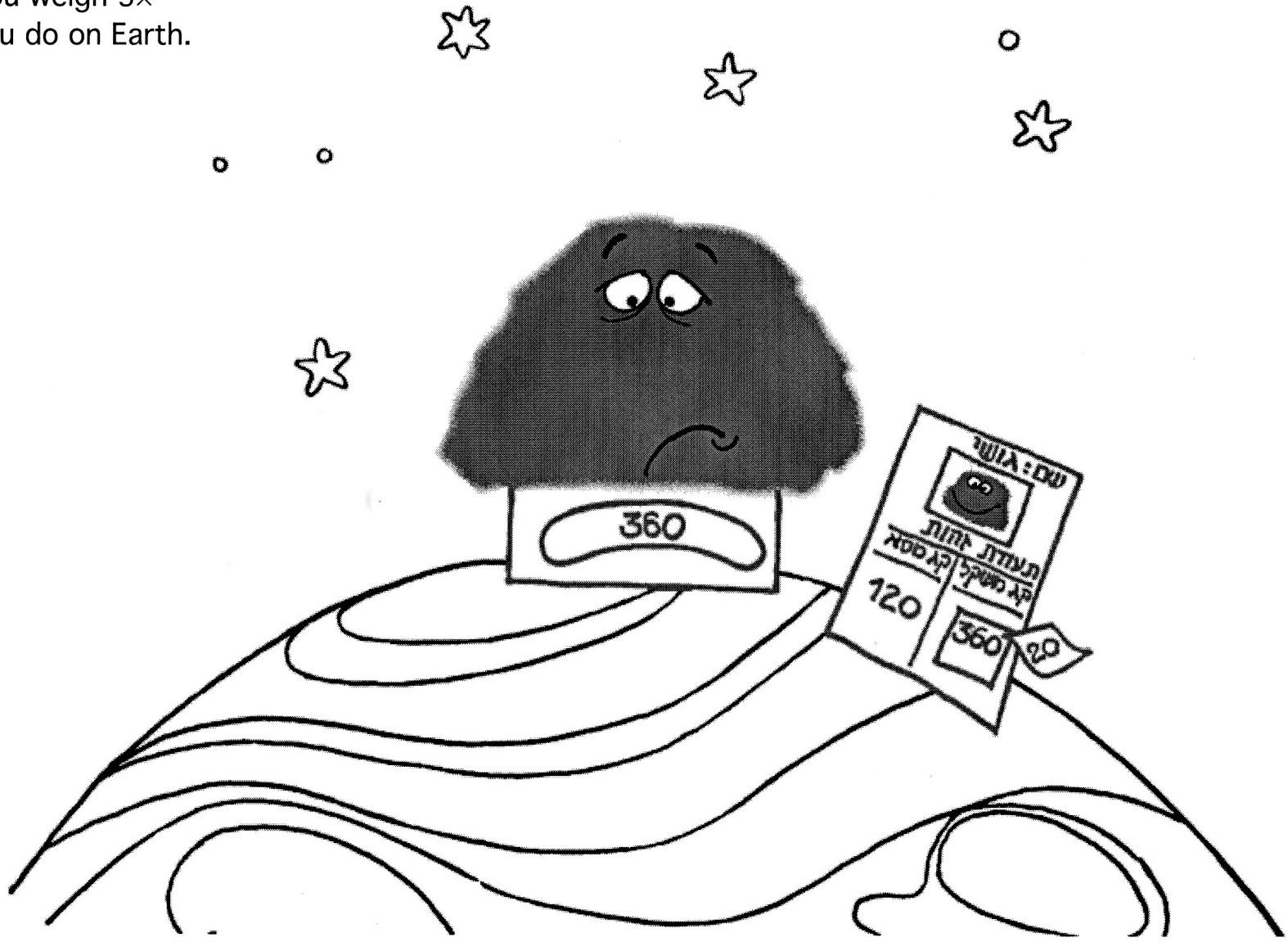
Landing on the moon felt the same. And then Chunky couldn't believe his eyes! Passport Control corrected the weight on his Identity card from 120 to 20 kg! Finally his wish was fulfilled!





Chunky suddenly thought of Litefoot. “Well, Professor, if you dare, come out here and let’s bet that we’ll be even on the see-saw.” Litefoot had never dreamed of such a loooooong see-saw. On one end sat Chunky, on the the Moon’s surface, and on the other end sat Litefoot on Earth. What a trick! After all, even though Chunky weighed 6× more than Litefoot, gravity on the Moon was 6× less than on Earth. So now they were balanced perfectly!

But it's not always like that in space. take Jupiter for example. There, you weigh 3× more than you do on Earth.



Dr. Litefoot gets back at Chunky,
“You thought you could get rid of
your big chunkiness! Let’s bet that
even here on your personal little
planet, on which you weigh almost
nothing, I’ll be able to get 6× fur-
ther when we’re pushed equally. I’ll
win because it’s mass that counts,
not weight...”

