
A Fine Balance

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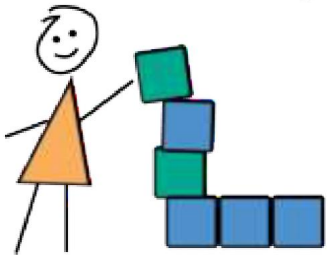

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One day Alice and her friend Luke were playing at the park on the seesaw.
They wanted to balance in the air at the same time.

When they sat down, Luke went up into the air and Alice fell to the ground.

“How come I went into the air when we sat down at the same time?” wondered Luke.

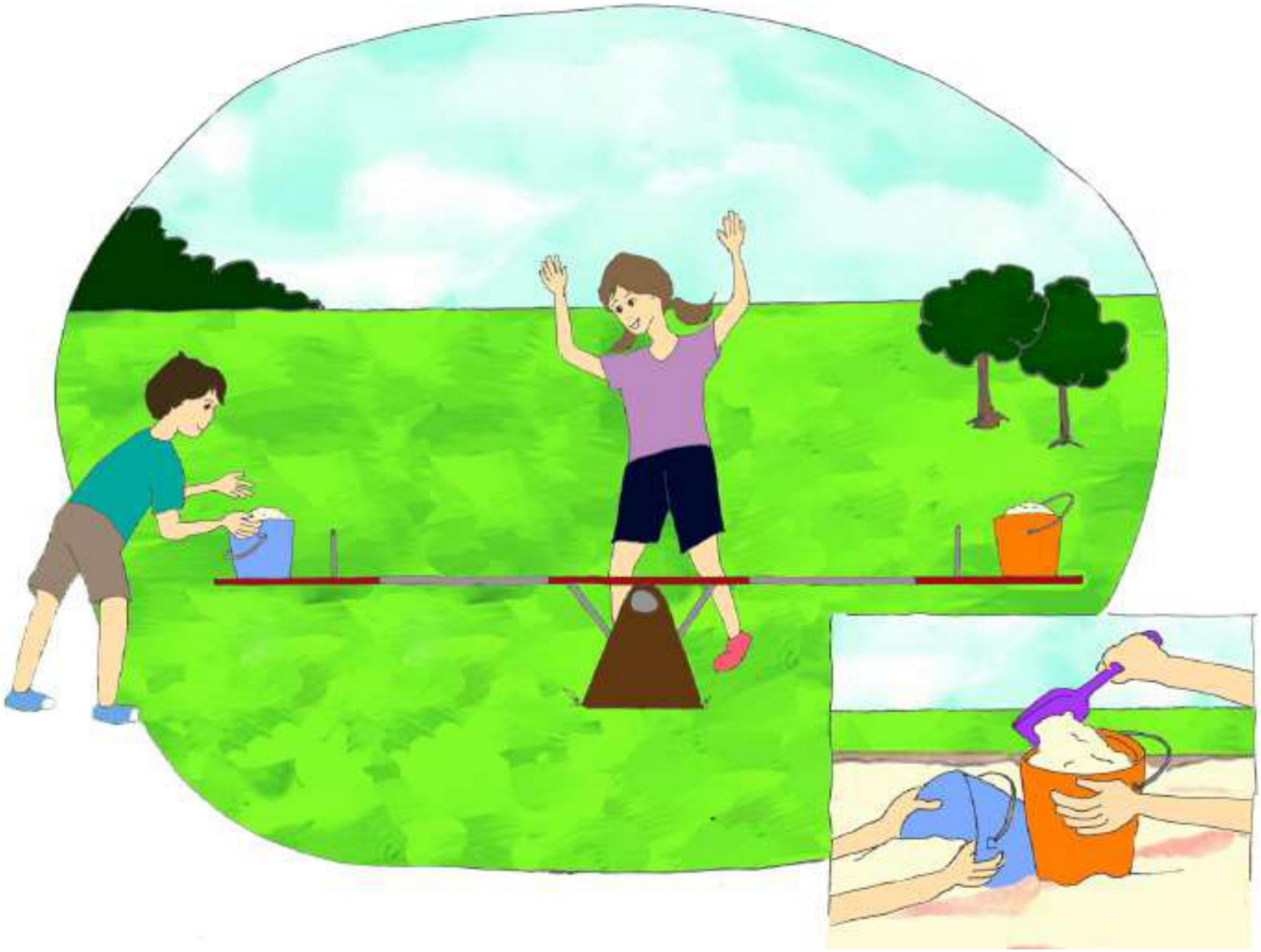
“That’s because we don’t weigh the same. Your side goes up because you’re lighter and my side goes down because I’m heavier!” said Alice.

“Isn’t there any way for us to be balanced even if one person is heavier?” asked Luke.

"Some people think that objects always balance when they're the same distance from the middle, but that's not always what happens. There is a way to balance objects when one side is heavier than the other. I'll show you," declared Alice.

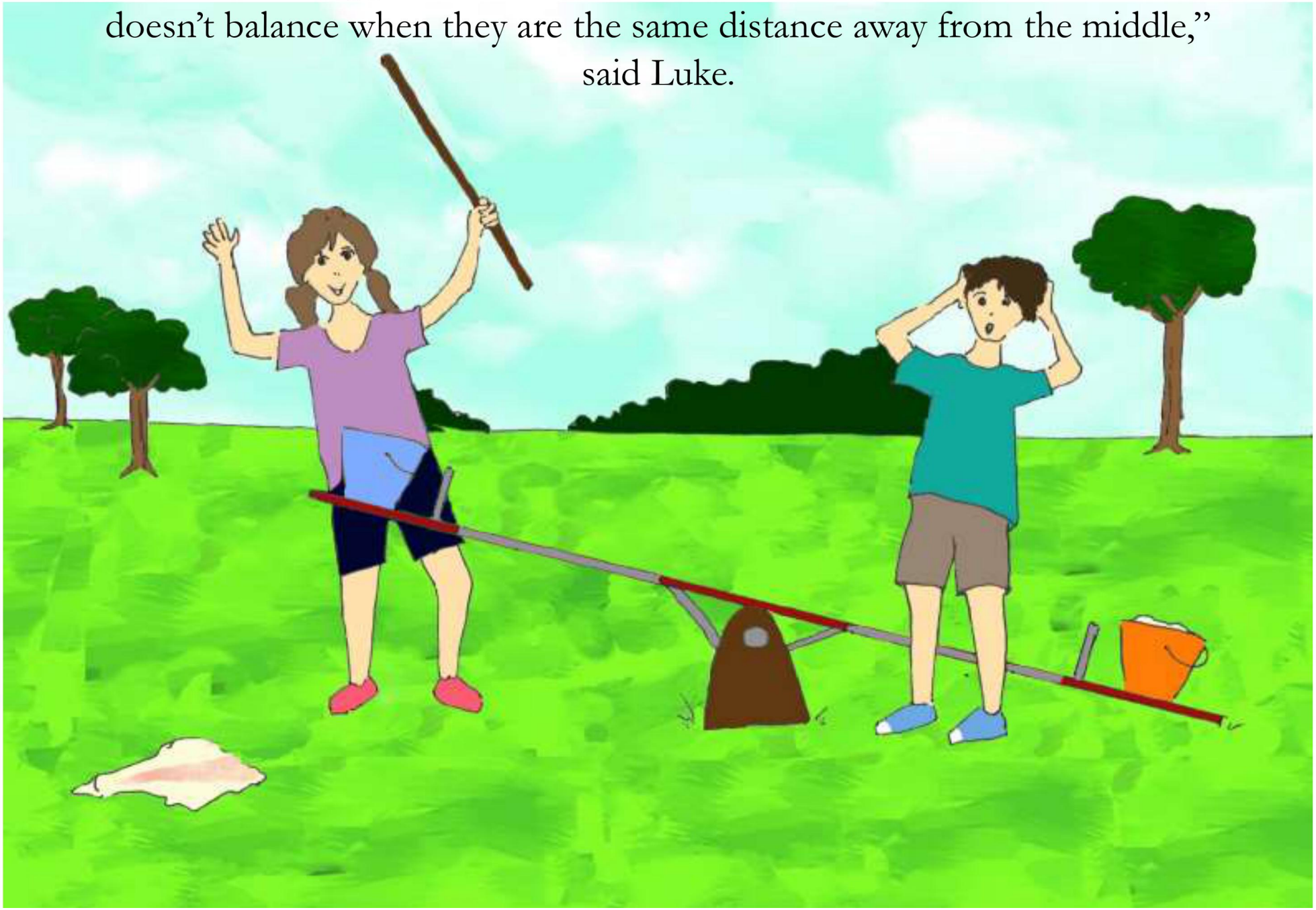
"When there is nothing on the seesaw it balances in the middle."

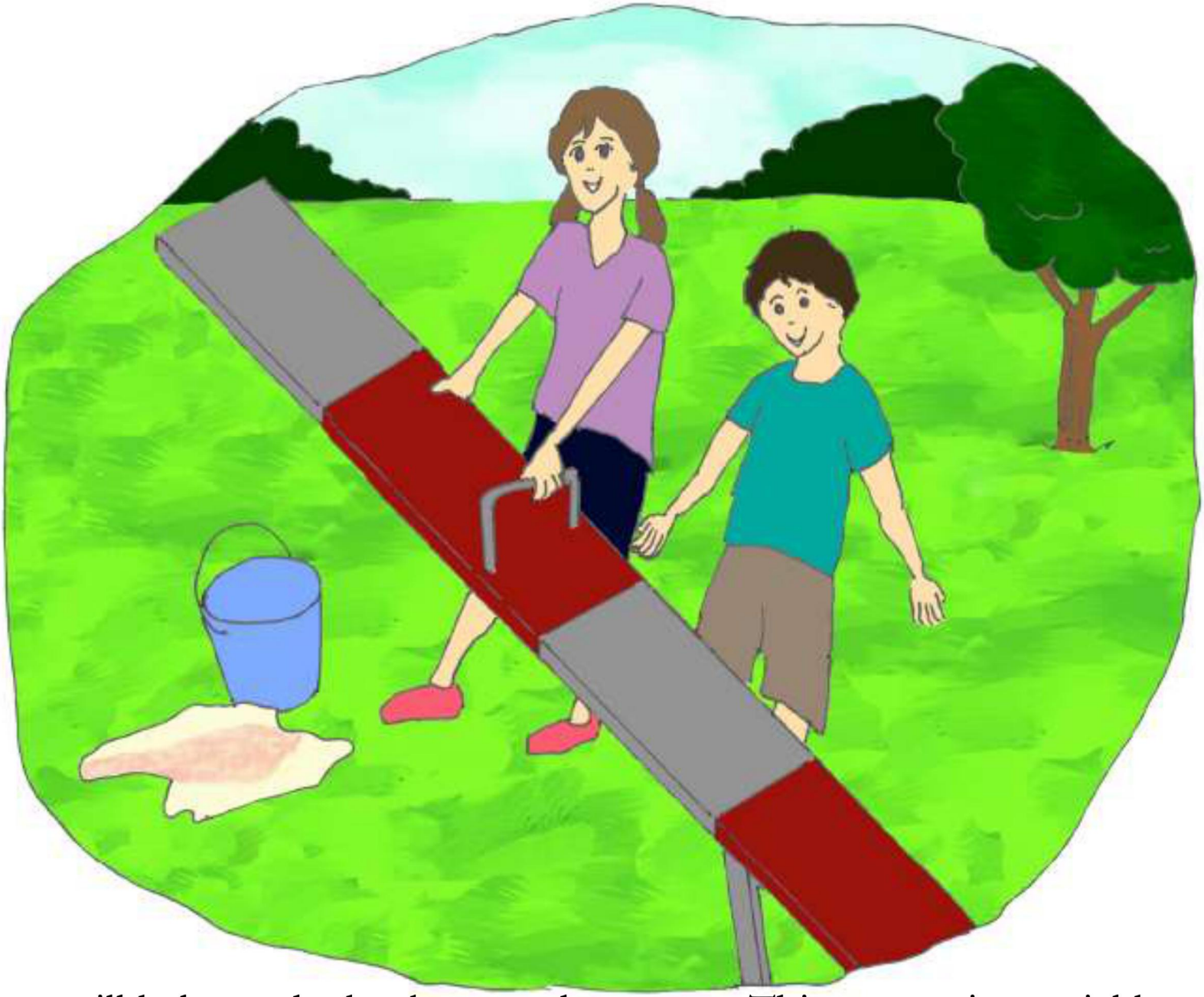
“Let’s try to balance the seesaw with objects that have the same weight.
We can use our buckets!” said Luke.
Luke and Alice filled their buckets with sand so that they weighed the same.
When they put the buckets on the end of the seesaw, it balanced when both buckets were the same distance away from the middle.



Alice took one of the buckets and dumped the sand out.

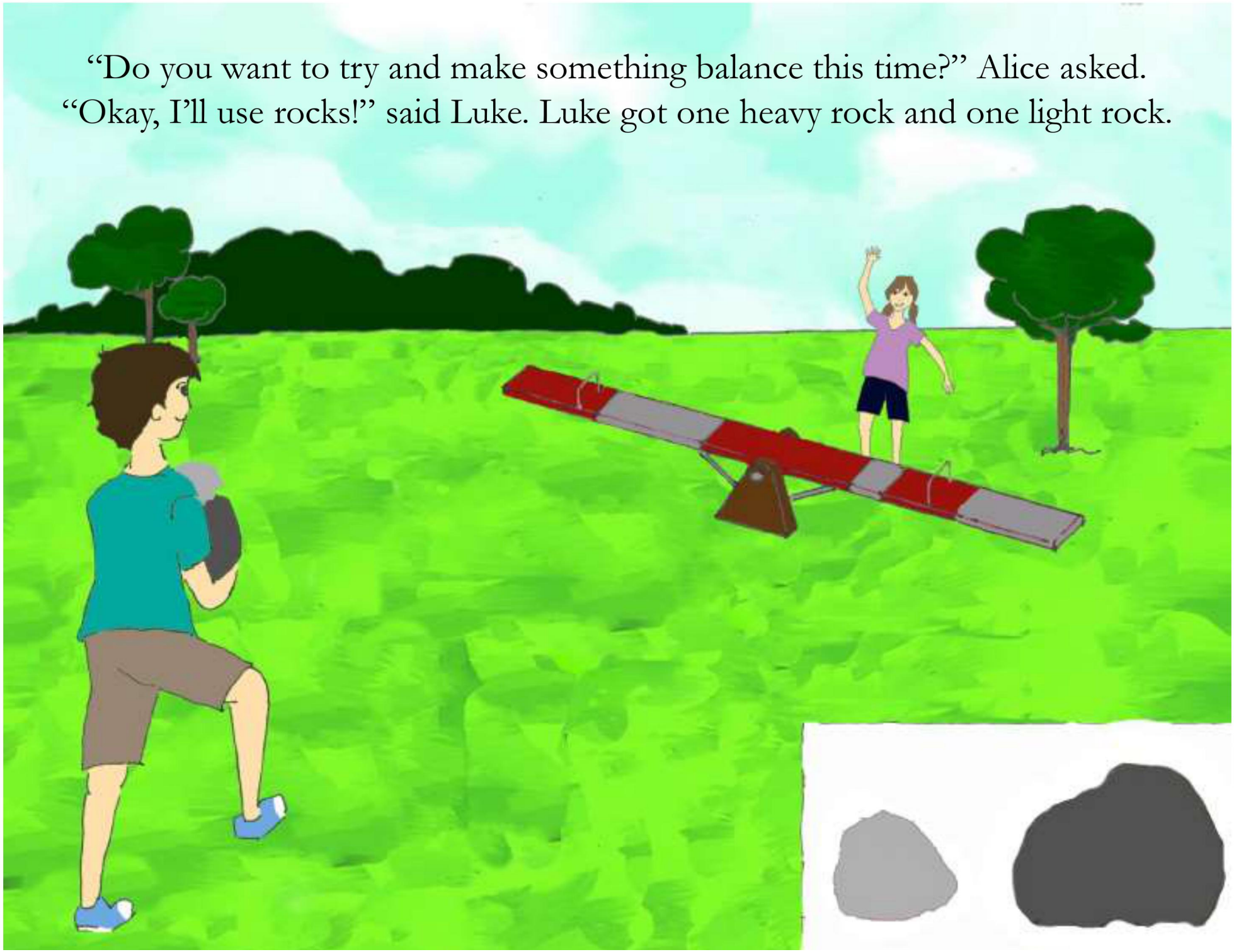
When she put the empty bucket back on, the light bucket went up and the heavy bucket dropped down. “Now the buckets don’t weigh the same so it doesn’t balance when they are the same distance away from the middle,” said Luke.



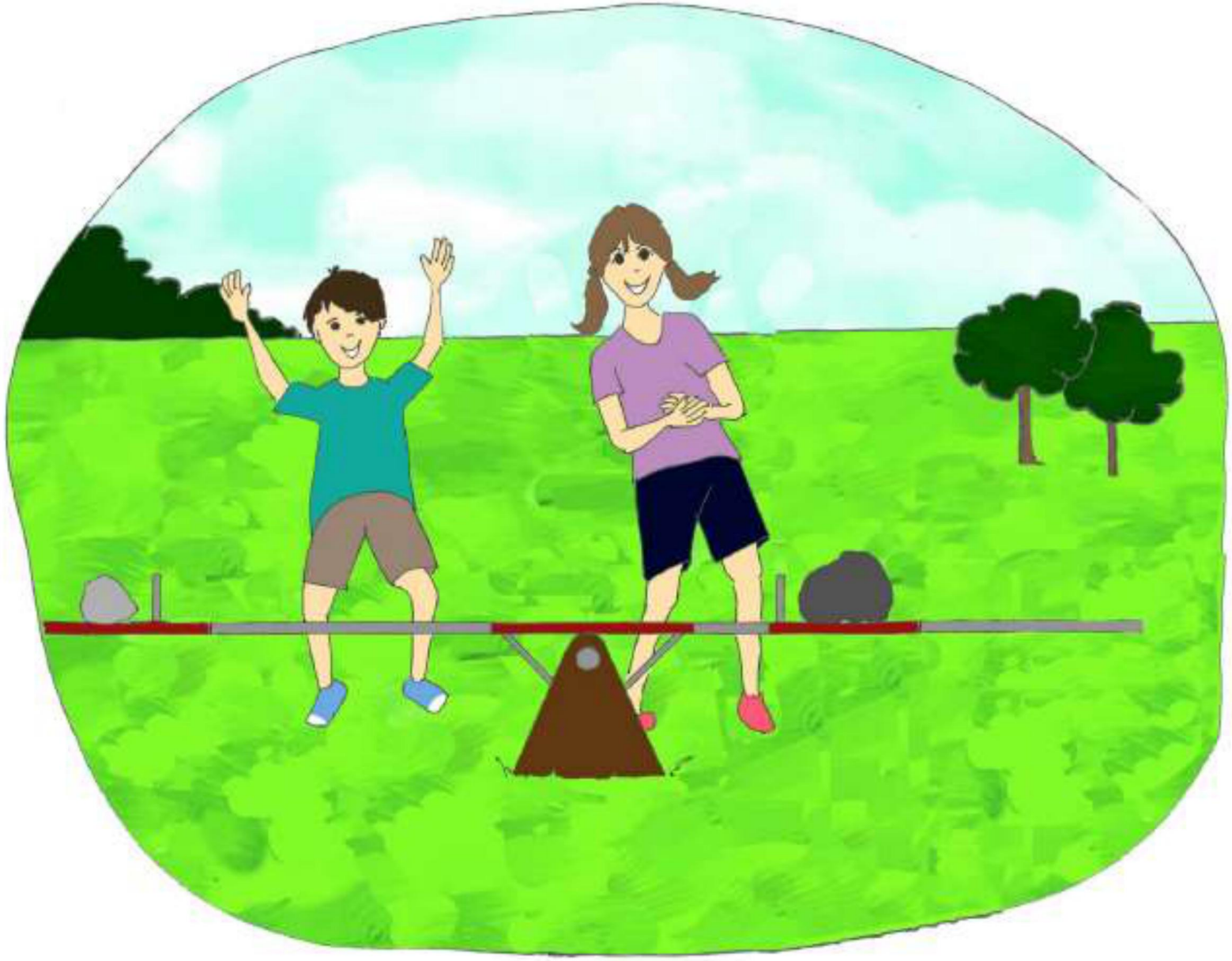


“We can still balance the buckets on the seesaw. This seesaw is special because we can move the seats closer to and further from the middle,” said Alice.

Alice moved the heavier bucket closer to the middle. She moved the seat holding the lighter bucket so that it was farther away. Now the seesaw is balanced.

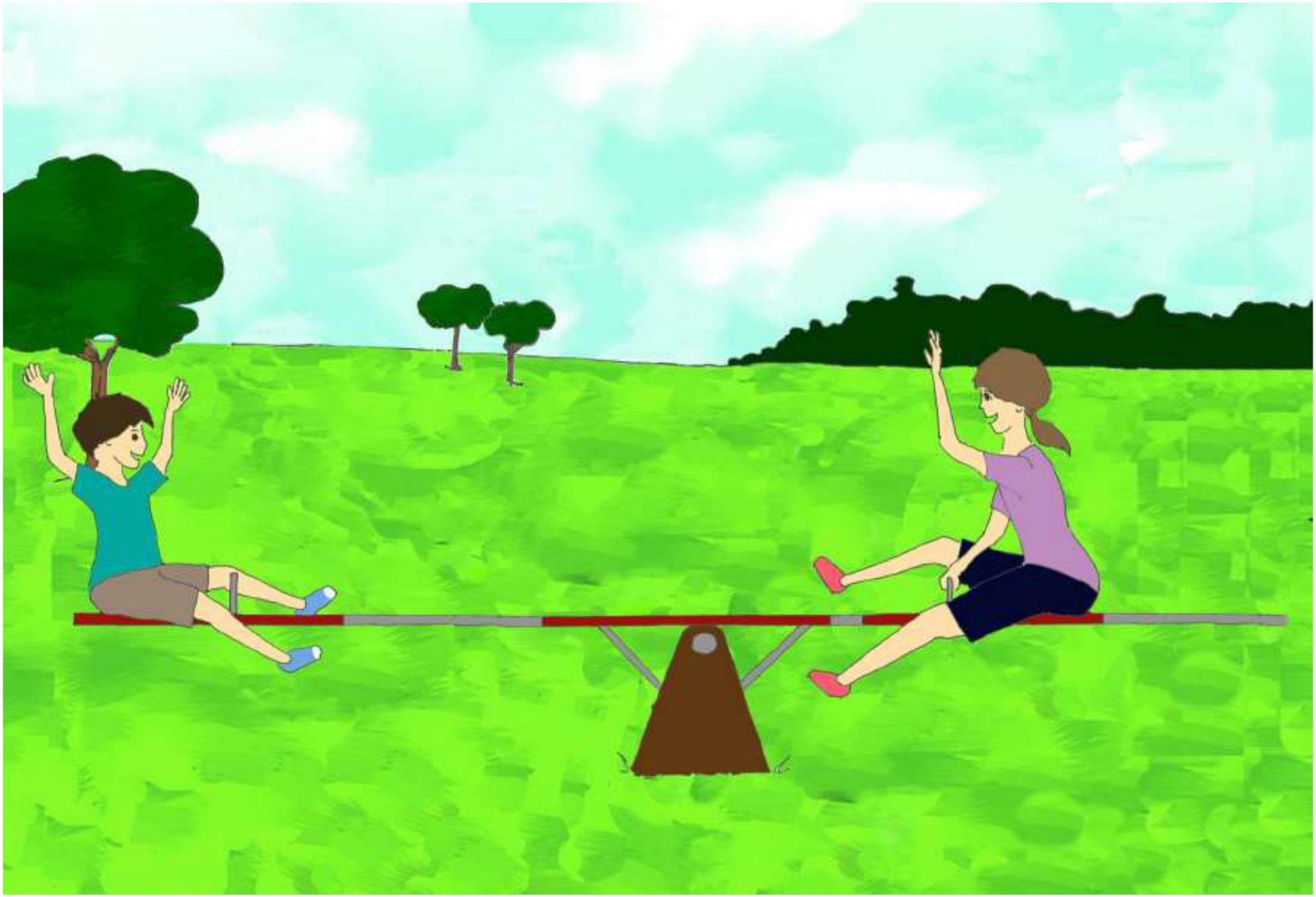

"Do you want to try and make something balance this time?" Alice asked.
"Okay, I'll use rocks!" said Luke. Luke got one heavy rock and one light rock.

Luke put the heavy rock on the seat that was closer to the middle and put the lighter rock on the seat that was farther away from the middle. Now the seesaw is balanced.



“I know how we can balance ourselves,” said Luke “You are heavier than me so you need to sit on the side that is closer to the middle! I’m lighter, so I need to sit on the side that is farther away.”

When Alice and Luke sat down at the same time, they stayed balanced in the air!

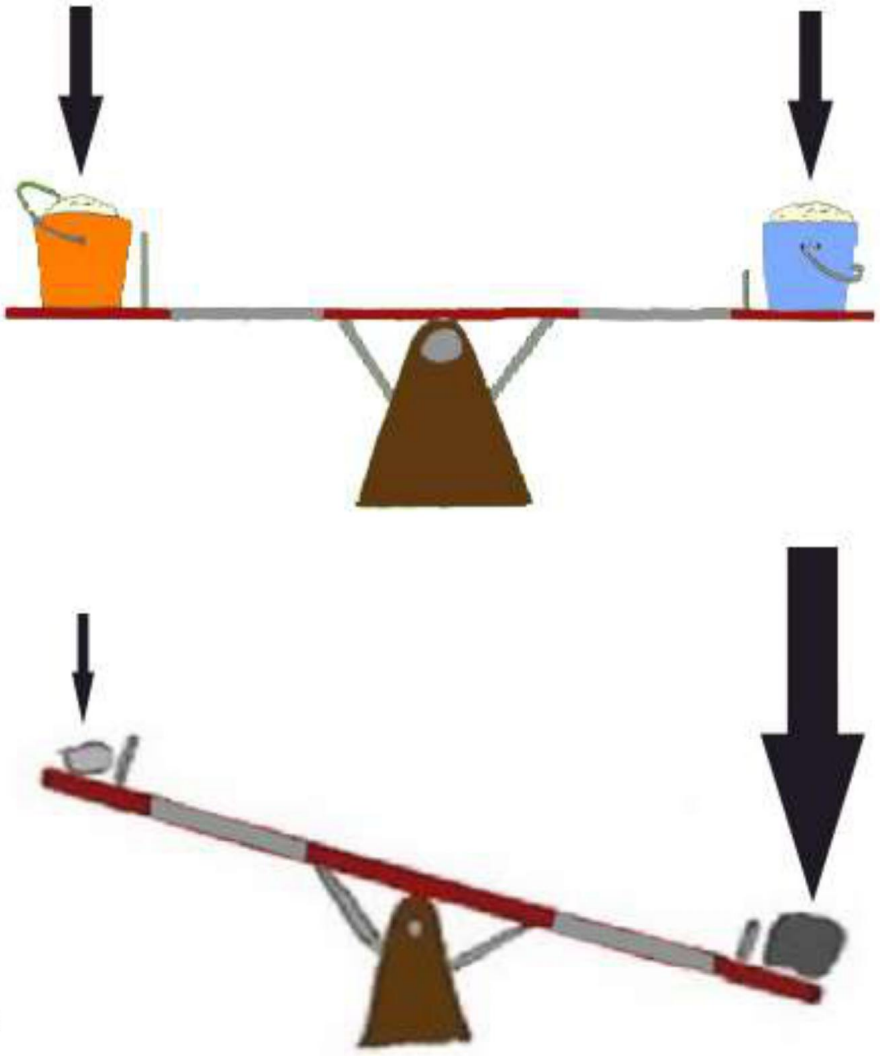


"So what did you learn today?" asked Alice.

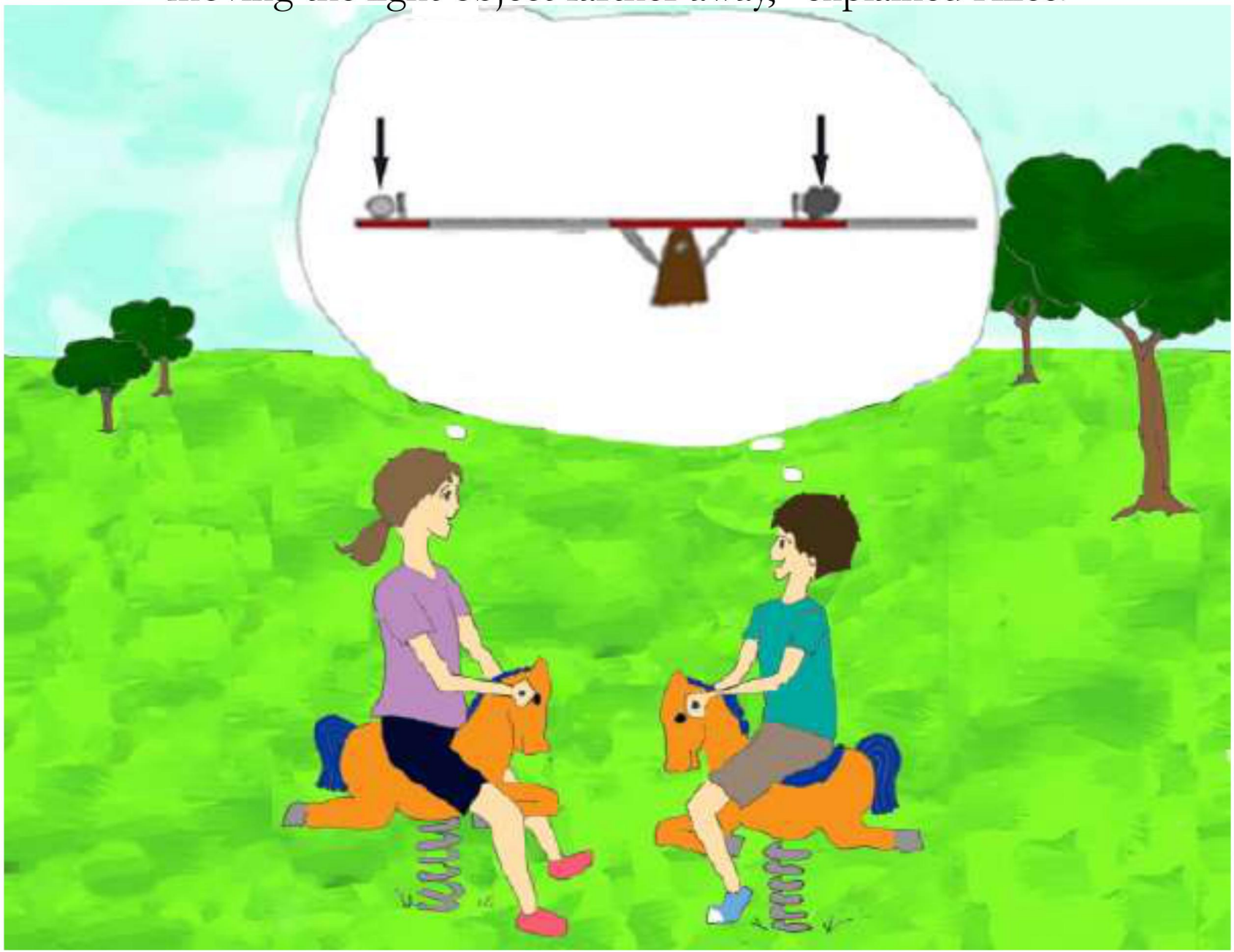
"Objects with the same weight balance when they are the same distance from the middle," Luke said.

"Right, a seesaw will only balance in the middle if the two objects have the same weight because then the force on both sides will be the same," Alice explained.

"When you have a heavy and light side, the seesaw won't balance in the middle because the heavier object has more force than the lighter object. In order to make a heavy and light object balance we need to make the force of each side the same," said Alice.



“We make the heavier side have a smaller force by moving the heavier object closer to the middle and the lighter side have a bigger force by moving the light object farther away,” explained Alice.



Luke ran to the seesaw. “But sometimes, it’s fun to not balance, so I can be up in the air!” he laughed.

Suggested Discussion Questions

1. The book told us that when you sit on a seesaw, one person goes up and one person goes down. Why is that? Which side goes up and which goes down?

2. How do you balance two objects that have the same weight?

3. How do you balance two objects that have different weight?

4. The end of the book talked about force. What does force mean?

5. When one side of the seesaw goes down and one side goes up, which side has more force?

6. Can anyone explain how to balance objects with the same weight while talking about their forces? How about objects with different weight?

Suggested Activity #1: Balance Beans

Materials: Balance Beans Game

- Choose Beans of the *same weight*. Place your Bean and have children place their Bean to balance.
- Choose Beans of *different weights*:
  - Place the heavier Bean and have children place the lighter Bean to balance
  - Place the lighter Bean and have children place the heavier Bean to balance
  - Have children place a heavier Bean first and place your lighter Bean to balance
- Discuss your findings!

Suggested Activity #2: Predicting Balance

Materials: fulcrum balance beam, prediction sheet, objects of the same and different weight

- Give children the activity sheets.
- Show them objects and ask them to circle predictions about how they will balance on the beam
- Test out their predictions. Discuss your findings!

Object	What I think it will do	What it did