A health science book for primary school children

The Health Choices Book:
Learning to think carefully about treatments

Informed Health Choices

Title	The Health Choices Book: Learning to think carefully about treatments. A health science book for primary school children
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Norwegian Institute of Public Health

MAKERERE UNIVERSITY
COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF RWANDA

The Research Council of Norway

John and Julie learn about
COMPARISONS of treatments

7

Fair comparisons with many people

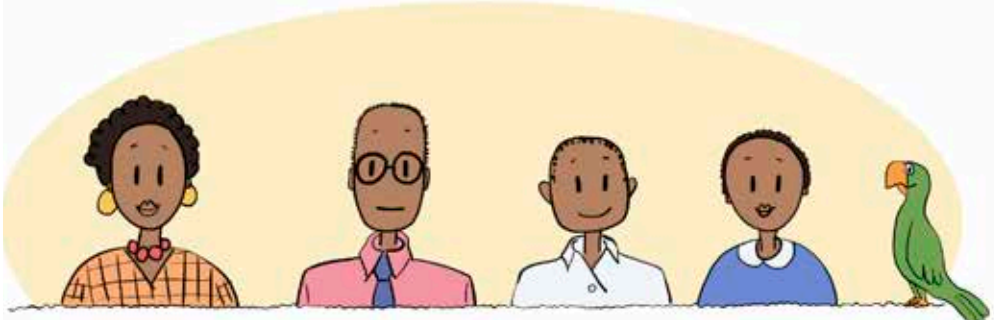
What you will learn in this lesson:

1. Why health researchers should give the treatments to many people in their fair comparisons

Keyword for this lesson:

Finding something by **CHANCE** *in comparisons that were too small* is finding something without knowing why it happened because the comparisons were too small.

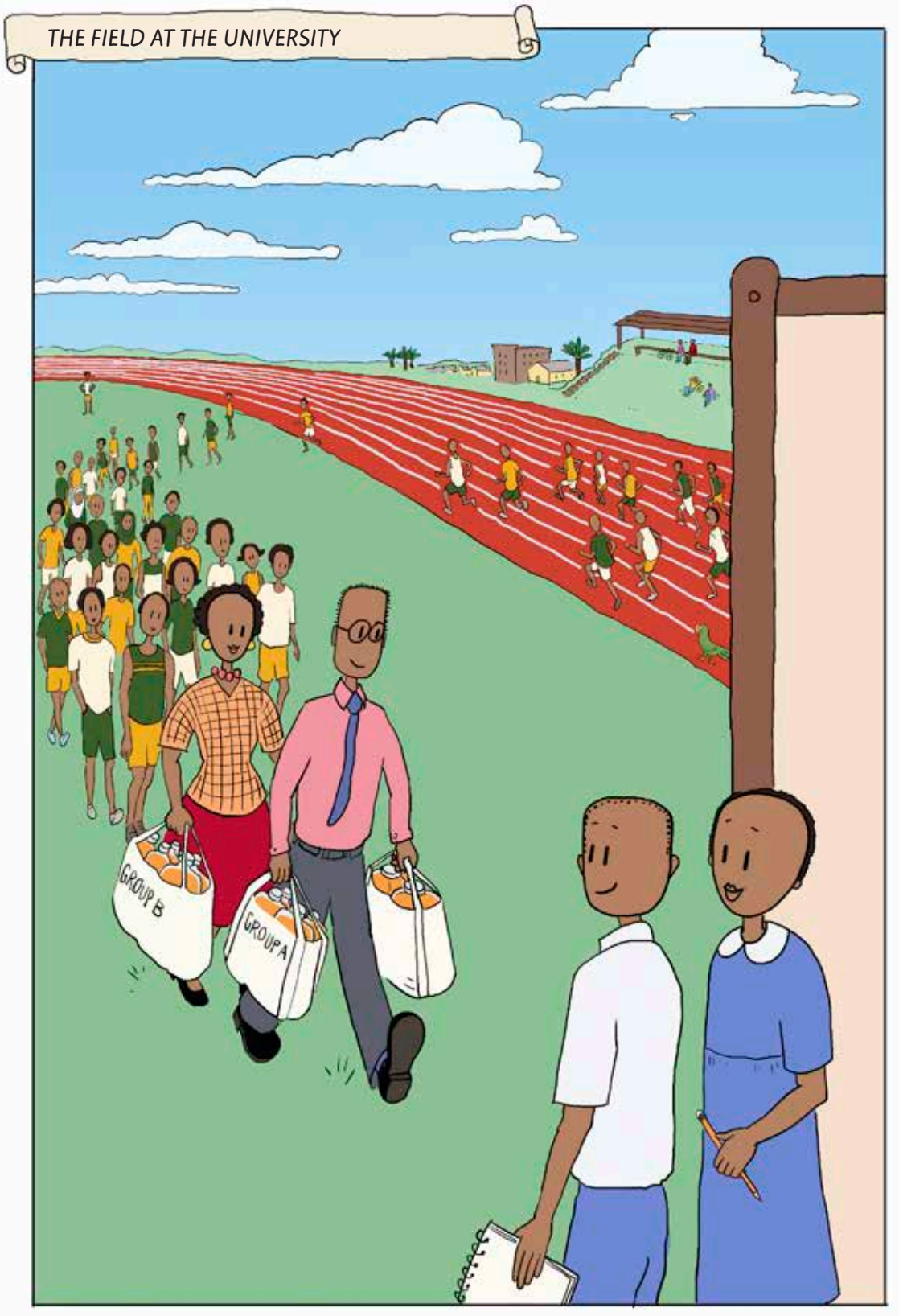
People in this lesson

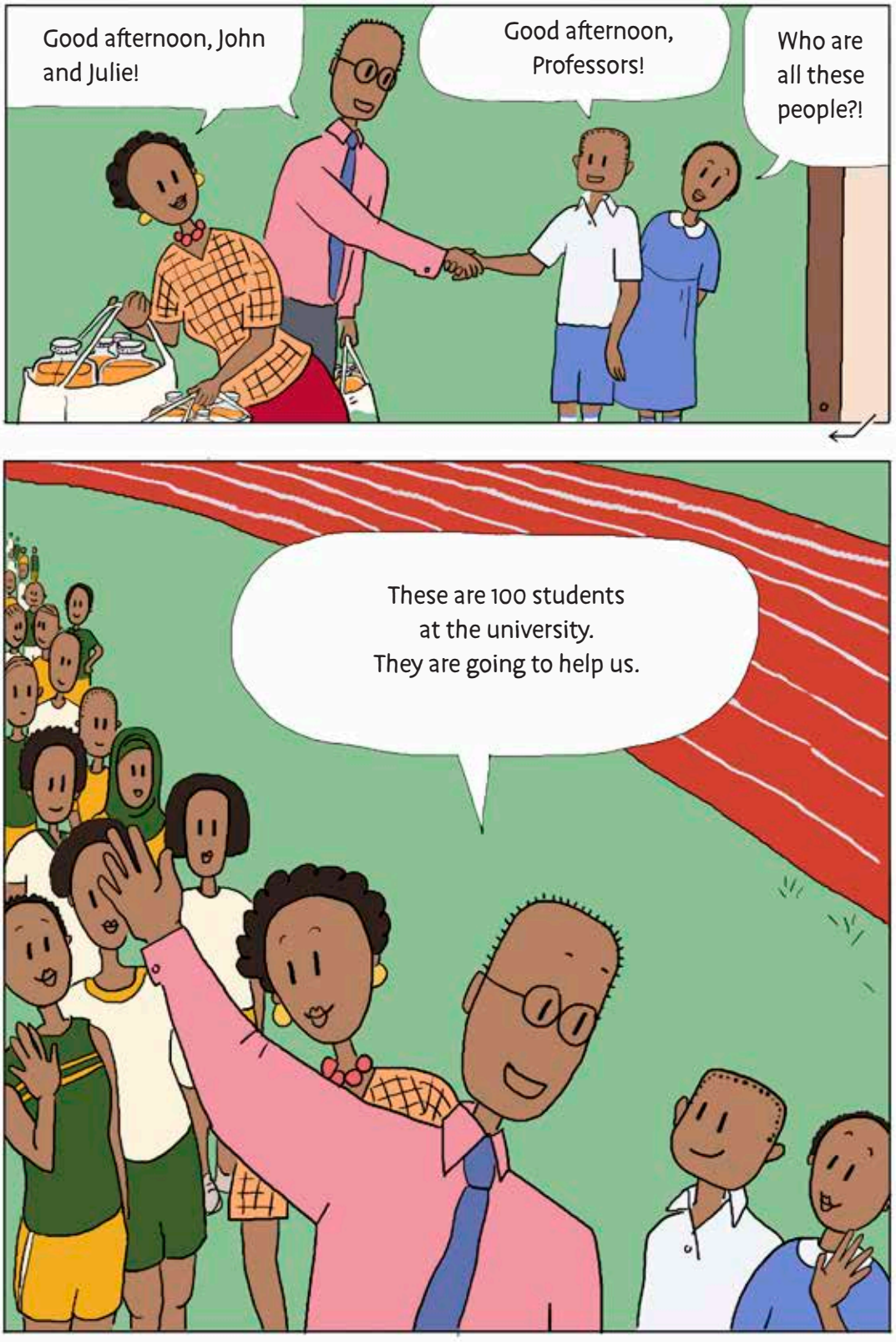


PROFESSOR COMPARE | PROFESSOR FAIR | JOHN | JULIE | KASUKU

RUNNERS AT THE UNIVERSITY

These are 100 runners at the university. They have come to the field to help John, Julie and the Professors make comparisons.


THE FIELD AT THE UNIVERSITY
GROUP B
GROUP A

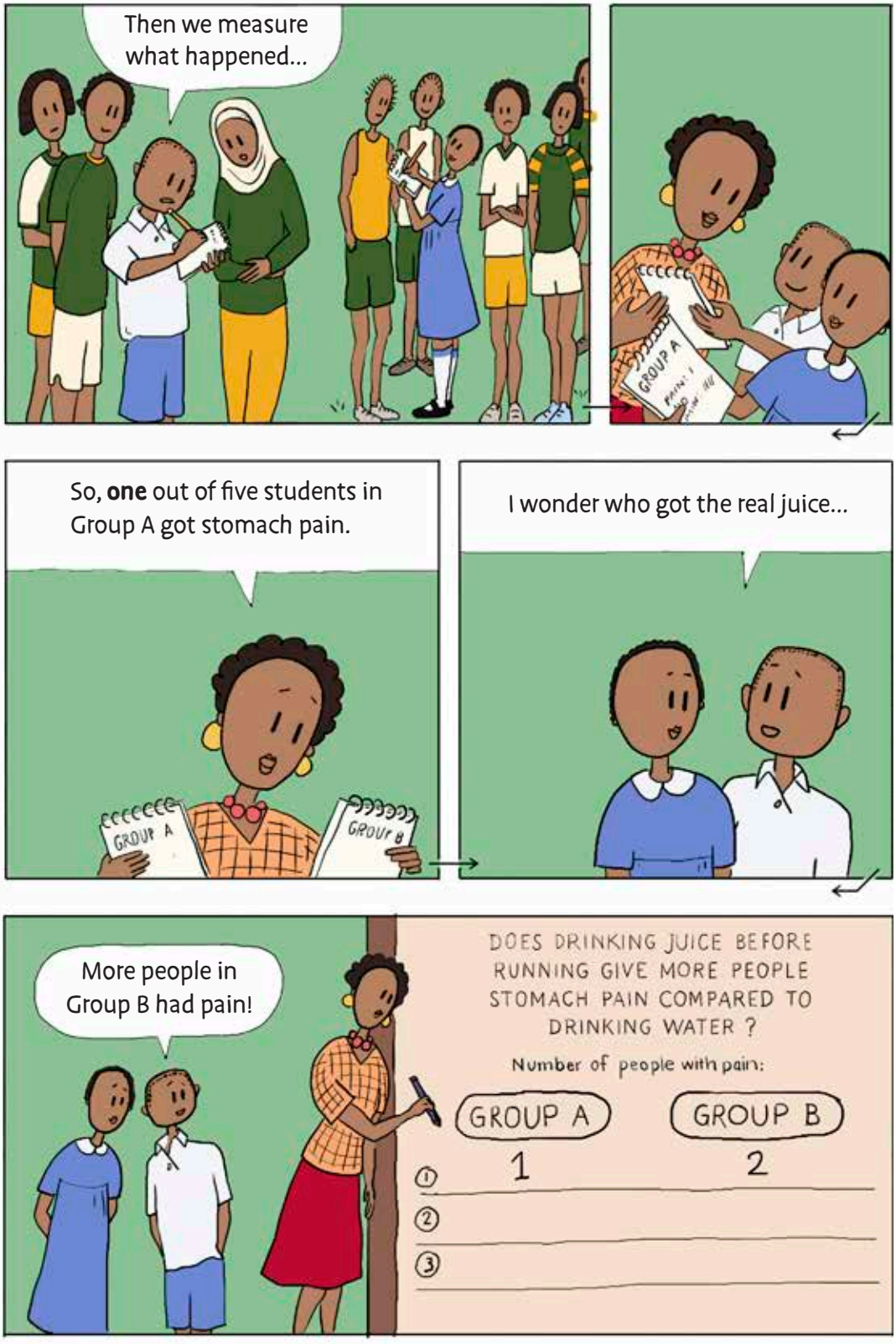

Good afternoon, John and Julie!
Good afternoon, Professors!
Who are all these people?!
These are 100 students at the university. They are going to help us.

Finding something by **CHANCE** *in comparisons that were too small* is finding something without knowing why it happened because the comparisons were too small.

IN LUGANDA: "Ekintu okuzuulibwa oba okusangibwa lwa mukisa bukisa oba lwa lukisakisa"
IN KISWAHILI: "Kibahati"

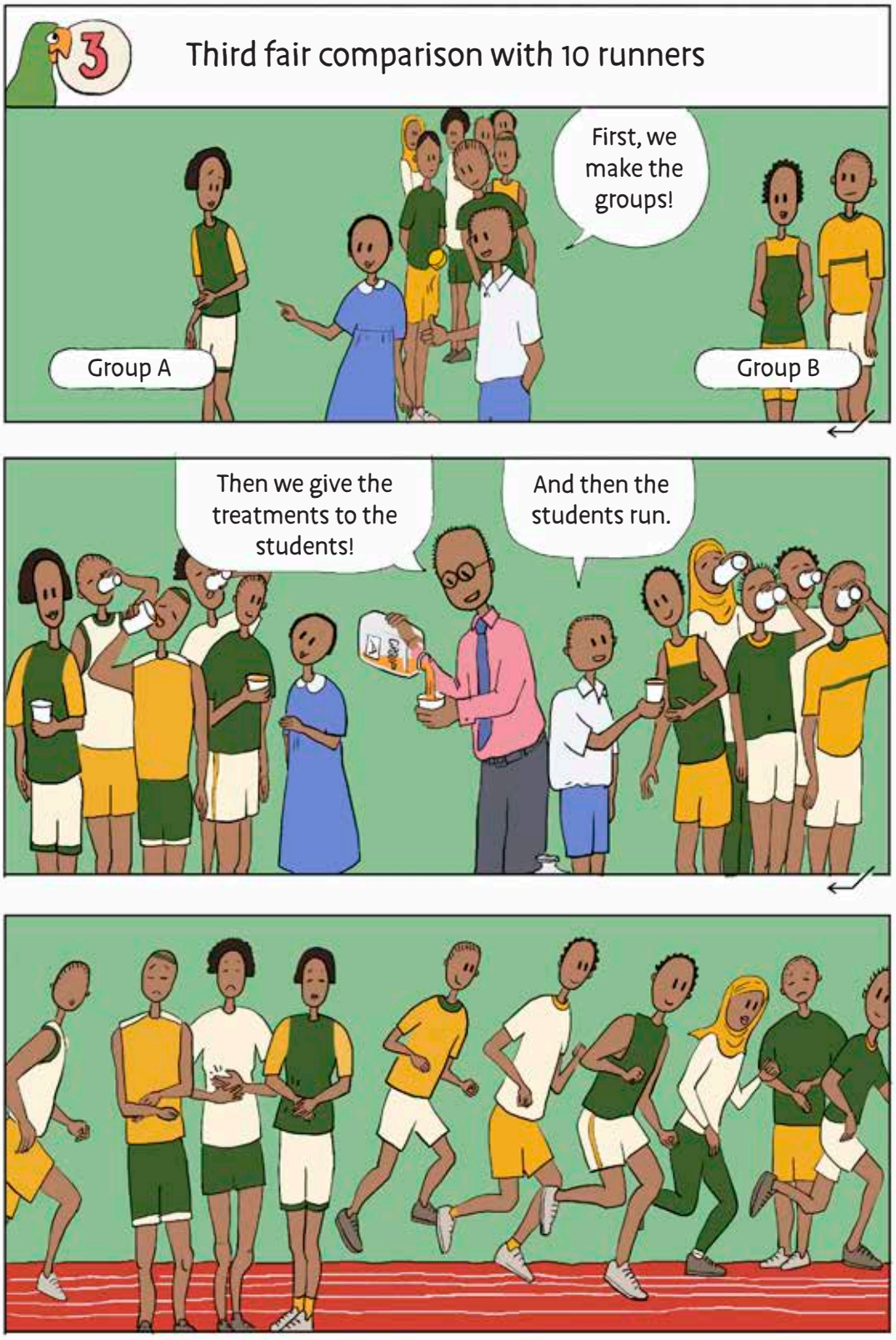
We will use the same treatments as last week: juice and water.
First we will make three comparisons with only 10 runners.
DOES DRINKING JUICE BEFORE RUNNING GIVE MORE PEOPLE STOMACH PAIN COMPARED TO DRINKING WATER

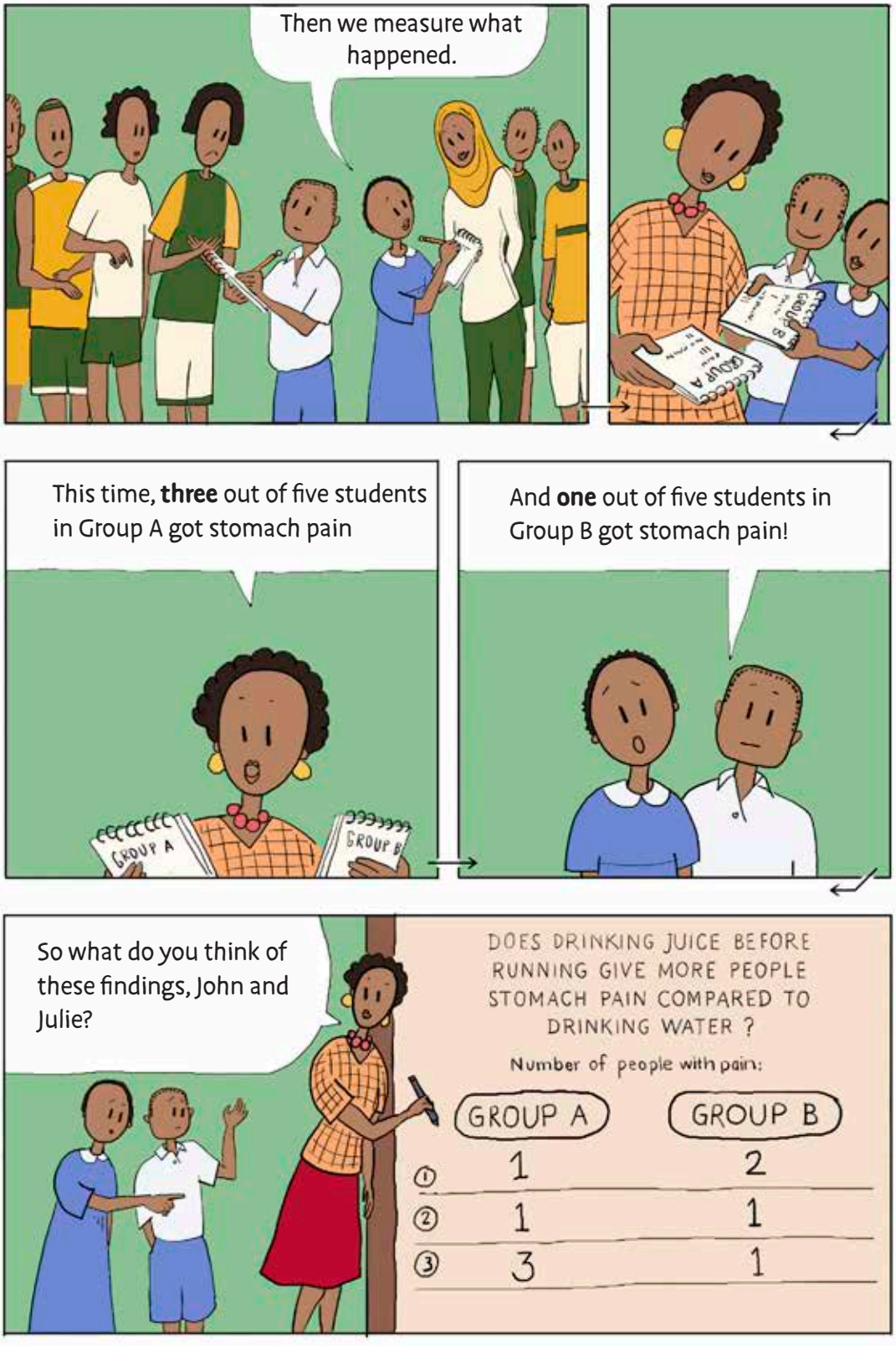
1
First fair comparison with 10 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
And then the students run.


Then we measure what happened...
GROUP A
So, one out of five students in Group A got stomach pain.
GROUP A
GROUP B
I wonder who got the real juice...
More people in Group B had pain!
DOES DRINKING JUICE BEFORE RUNNING GIVE MORE PEOPLE STOMACH PAIN COMPARED TO DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1
2
1
2
3

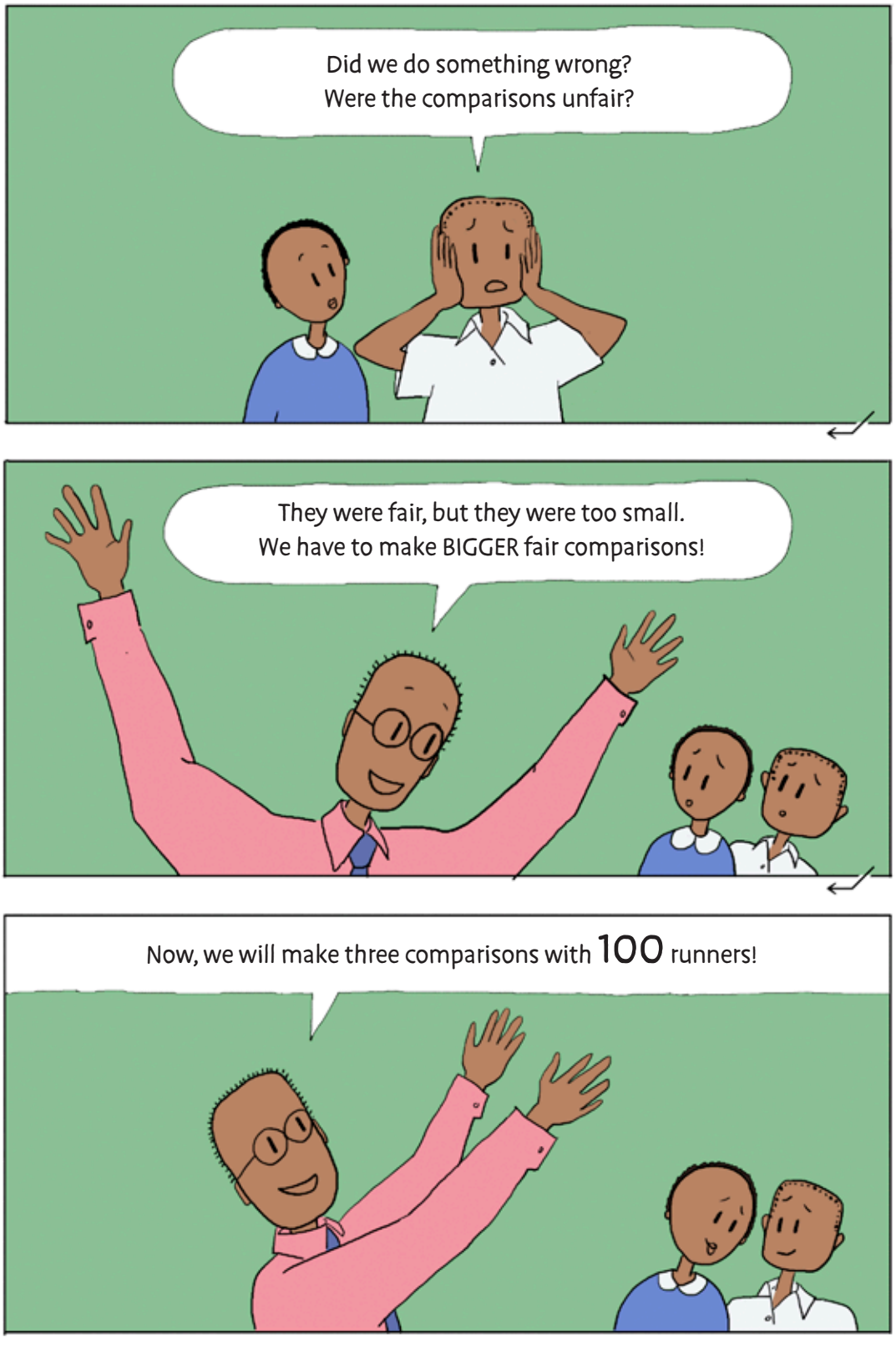
2
Second fair comparison with 10 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
And then the students run.

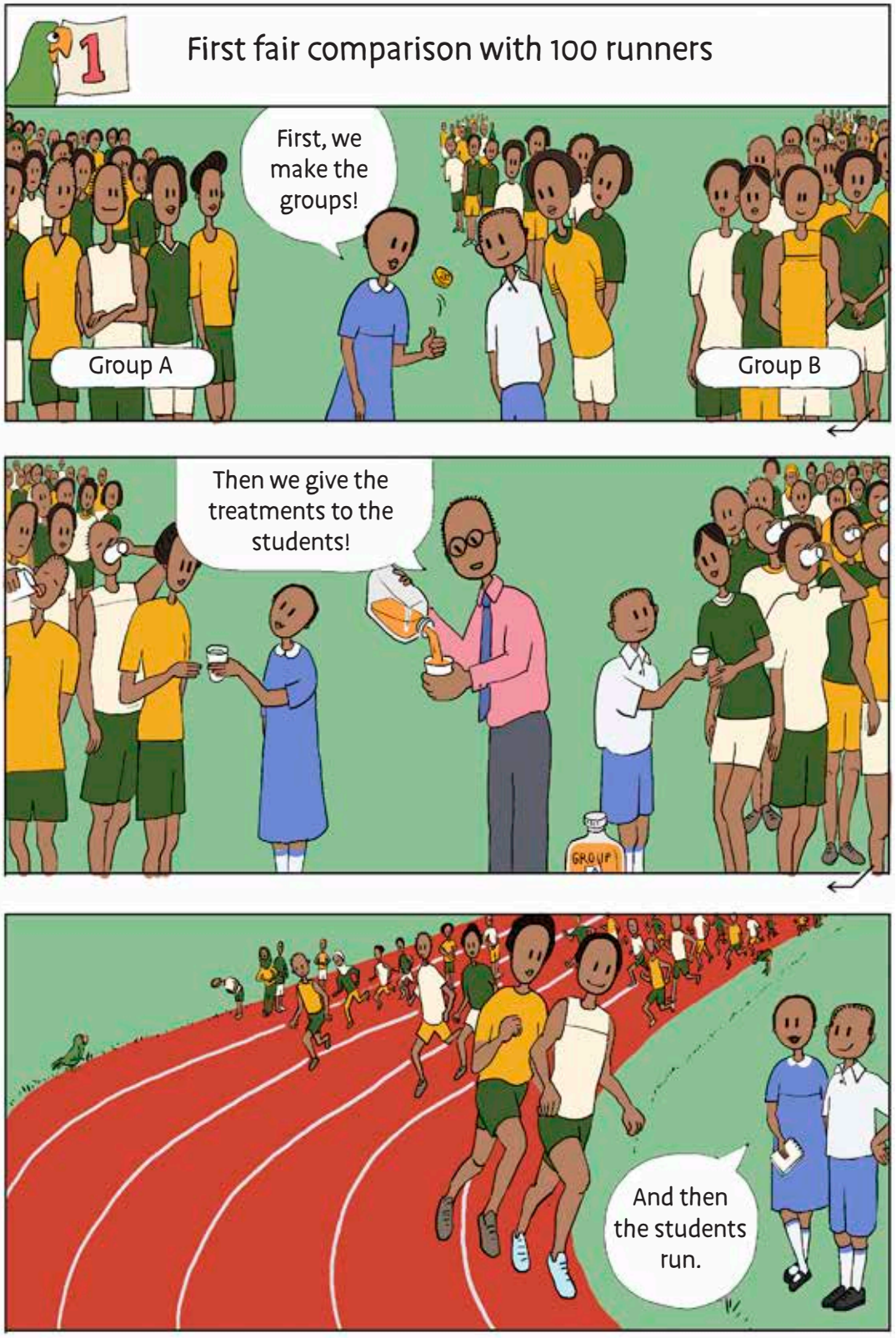
Then we measure what happened...
This time, **one** out of five students in Group A got stomach pain.
GROUP A
GROUP B
And **one** out of five students in Group B got stomach pain!
There was no difference this time!
DOES DRINKING JUICE BEFORE RUNNING GIVE MORE PEOPLE STOMACH PAIN COMPARED TO DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1
2
1
1
3

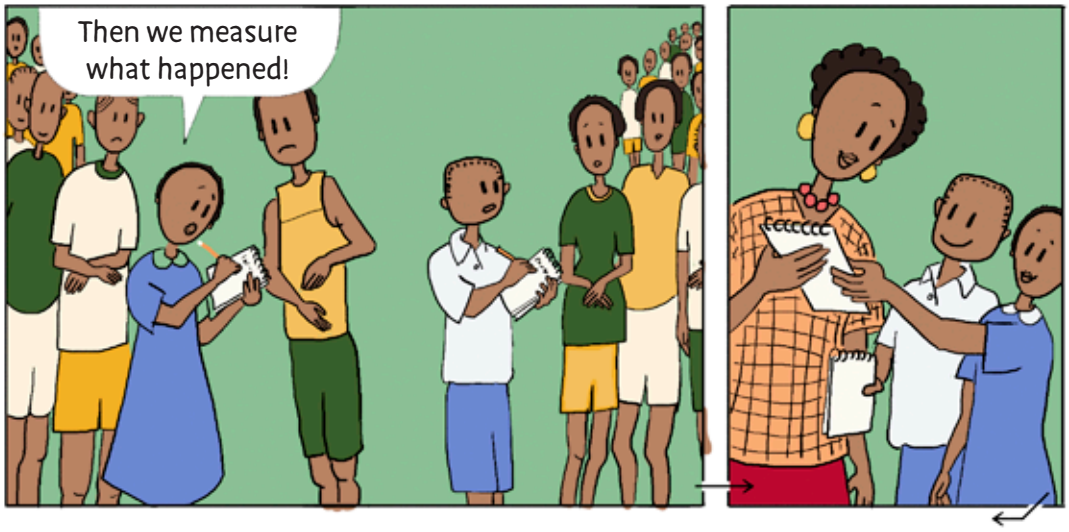

3
Third fair comparison with 10 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
And then the students run.

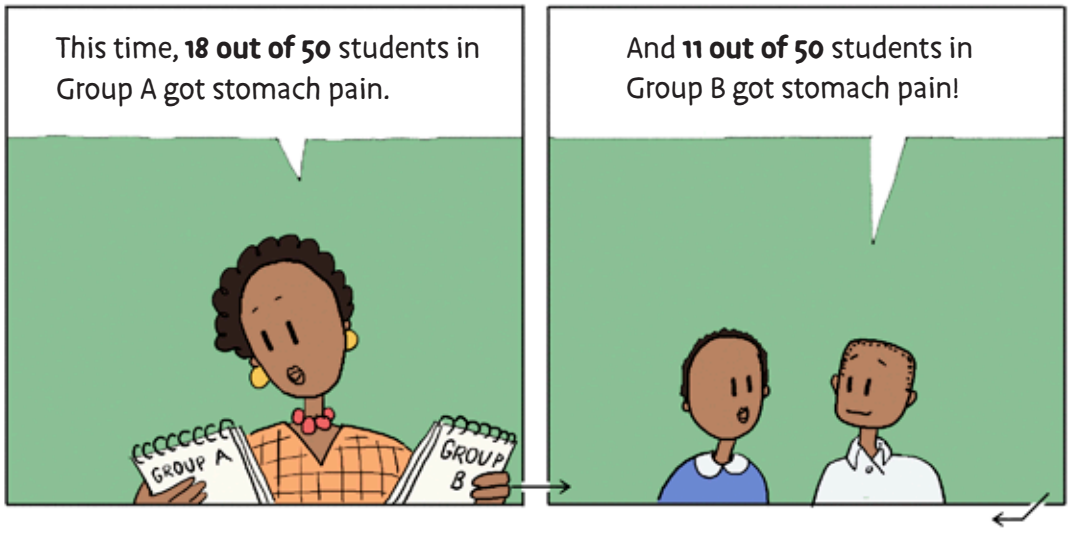

Then we measure what happened.
This time, three out of five students in Group A got stomach pain
GROUP A
GROUP B
And one out of five students in Group B got stomach pain!
So what do you think of these findings, John and Julie?
DOES DRINKING JUICE BEFORE RUNNING GIVE MORE PEOPLE STOMACH PAIN COMPARED TO DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1 1 2
2 1 1
3 3 1

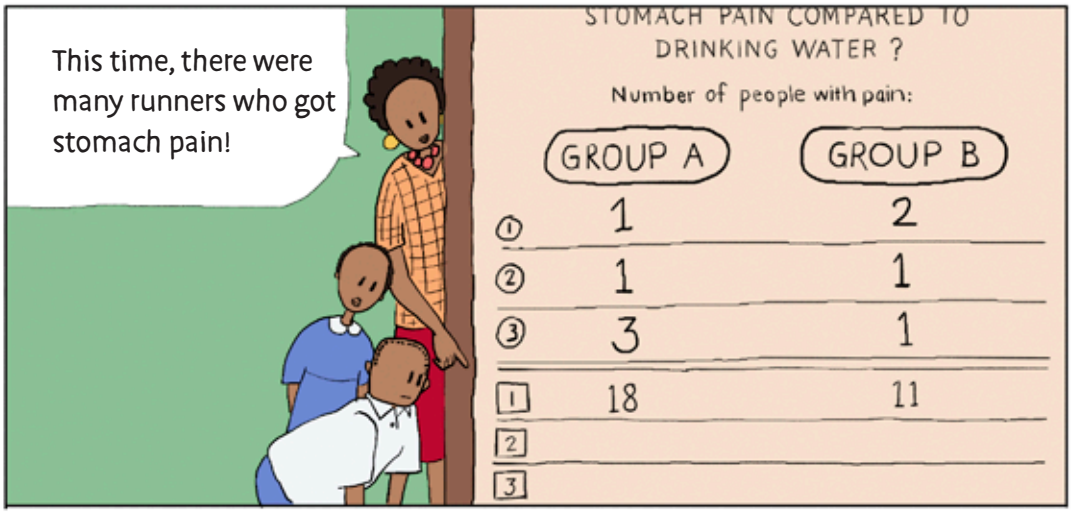
We found something different every time!
The first time, more of the runners in Group B got stomach pain!
The second time, the same number of runners in each group got stomach pain.
And the third time, more of those in Group A got stomach pain!

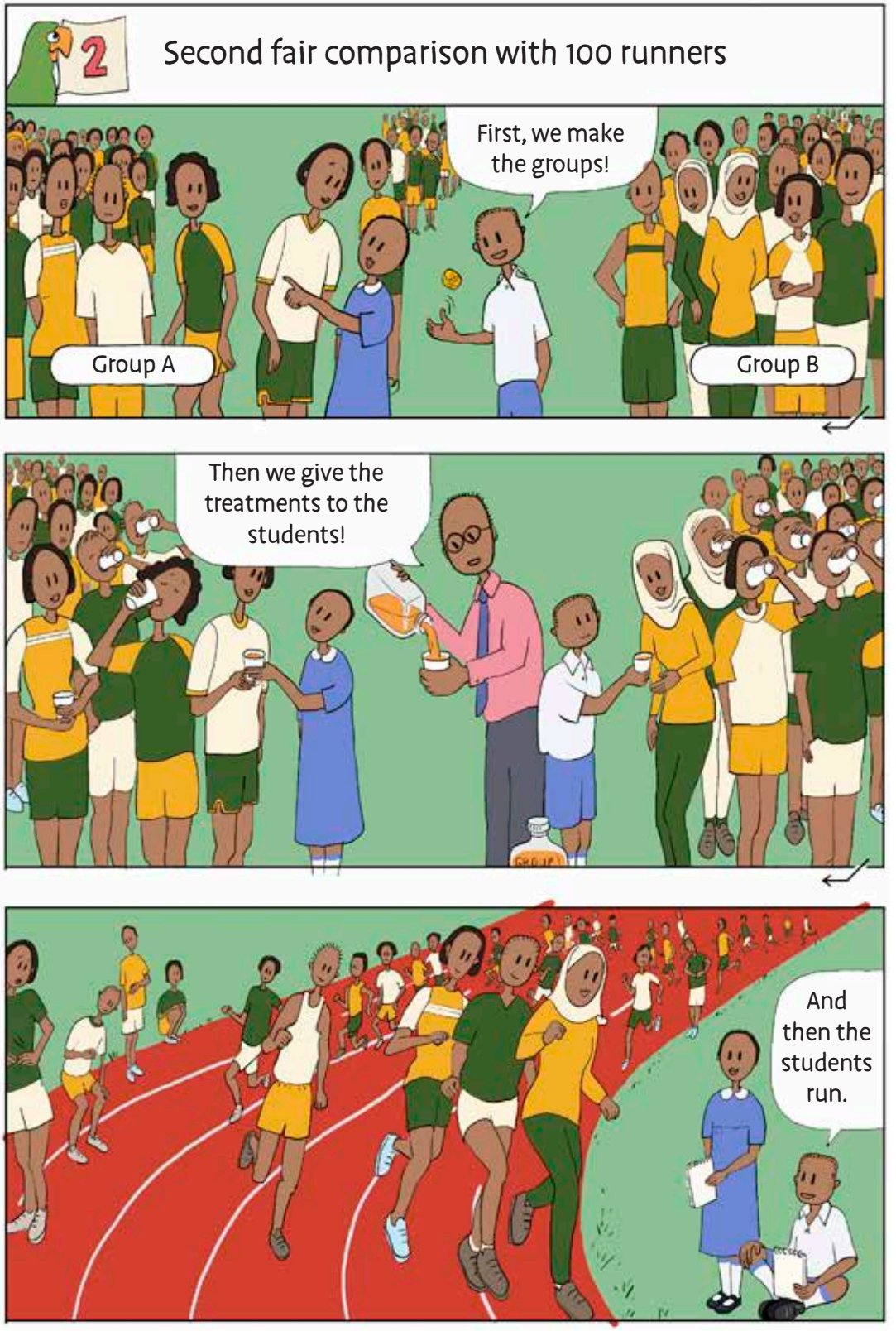

Did we do something wrong?
Were the comparisons unfair?
They were fair, but they were too small.
We have to make BIGGER fair comparisons!
Now, we will make three comparisons with 100 runners!

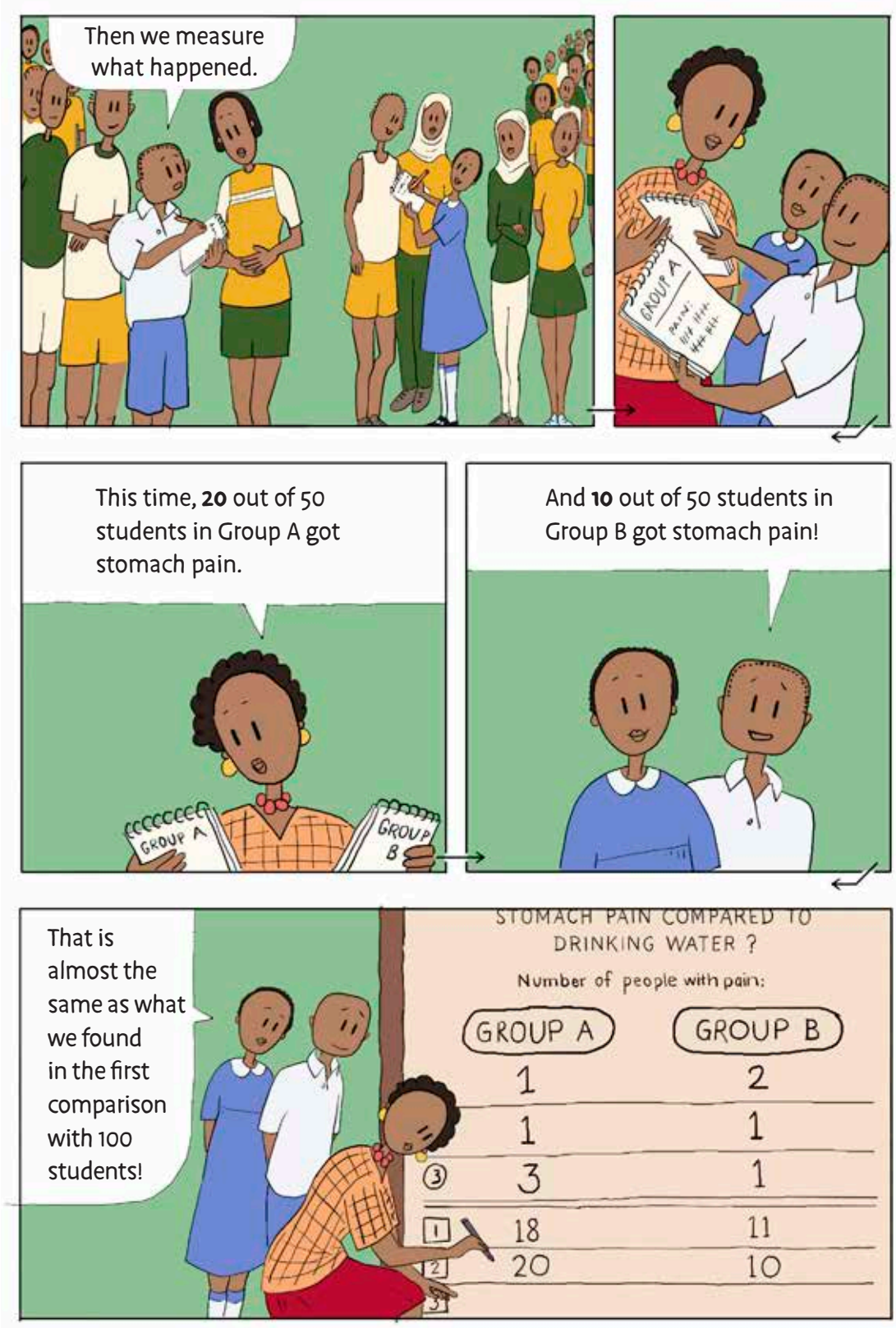

1
First fair comparison with 100 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
GROUP
And then the students run.

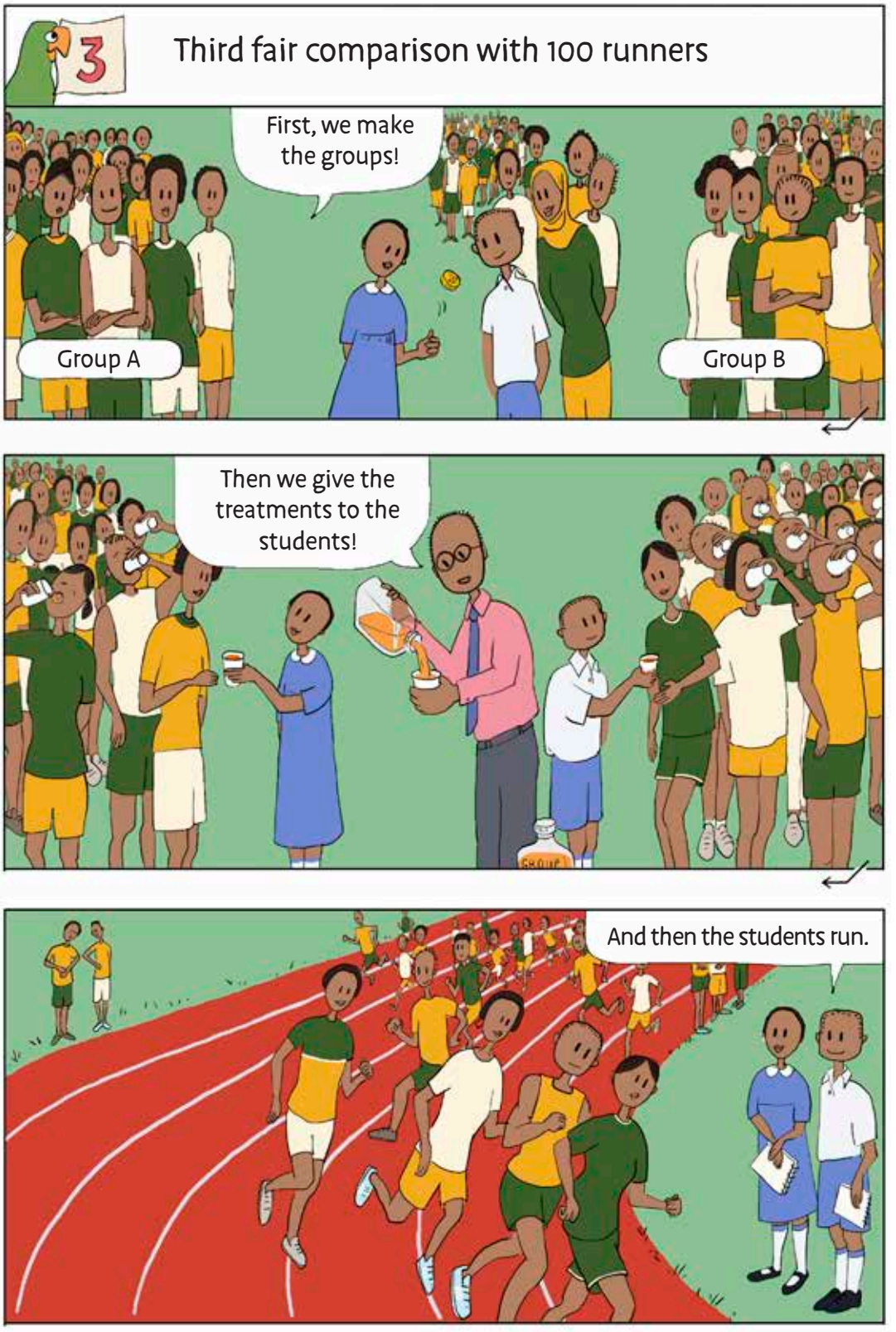

Then we measure what happened!

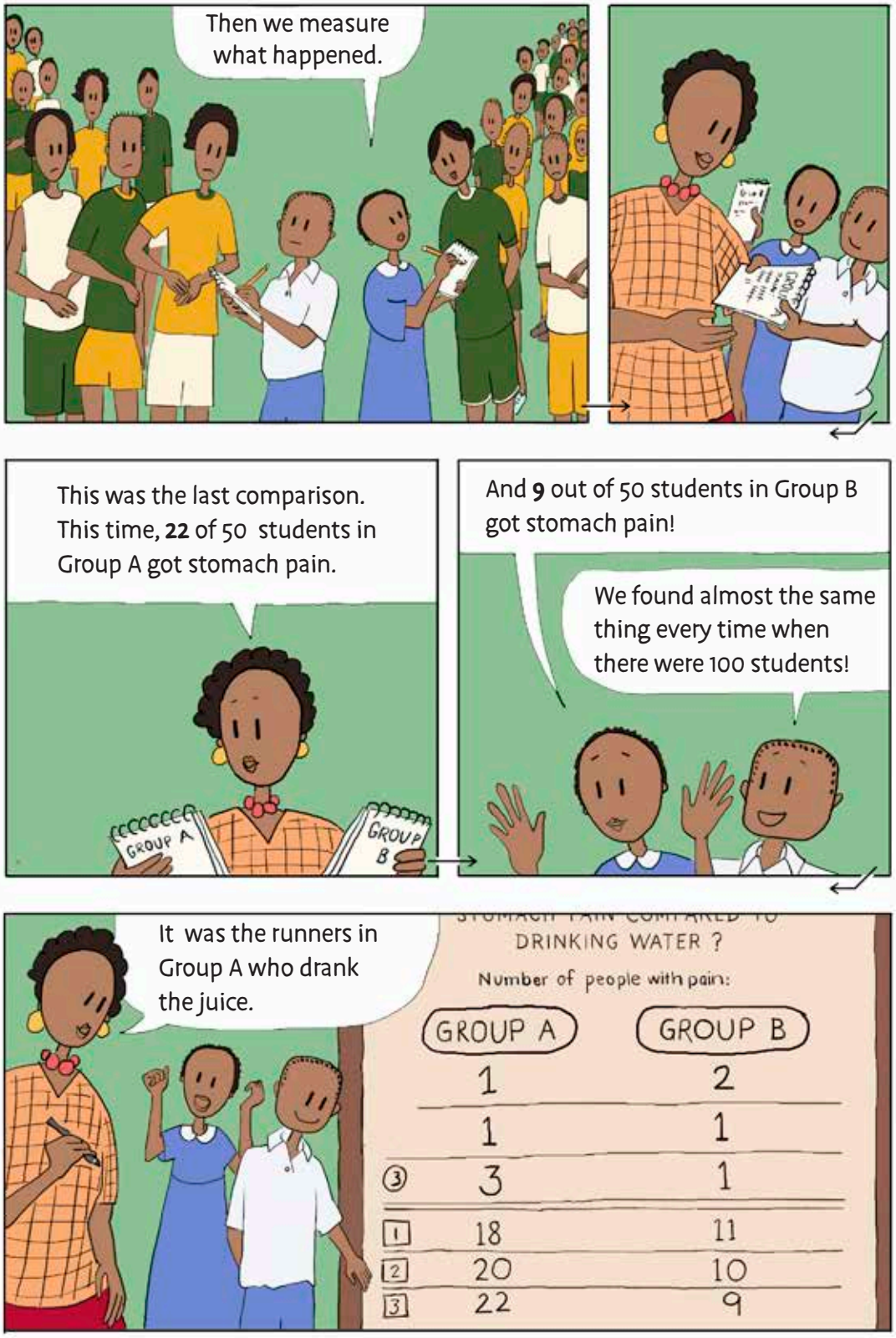

This time, **18 out of 50** students in Group A got stomach pain.
And **11 out of 50** students in Group B got stomach pain!
GROUP A
GROUP B

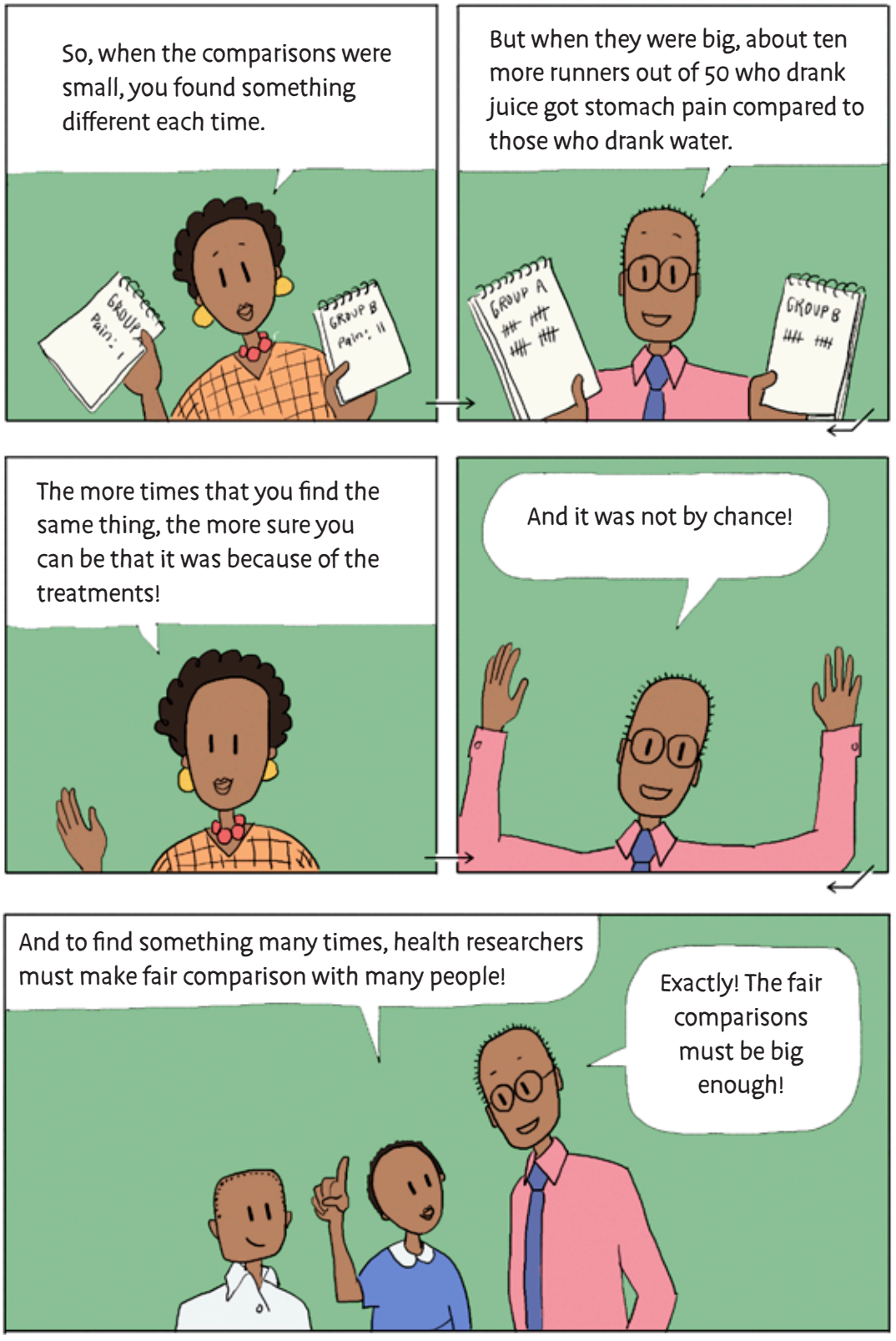

This time, there were many runners who got stomach pain!
STOMACH PAIN COMPARED TO DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1 1 2
2 1 1
3 3 1
1 18 11
2
3

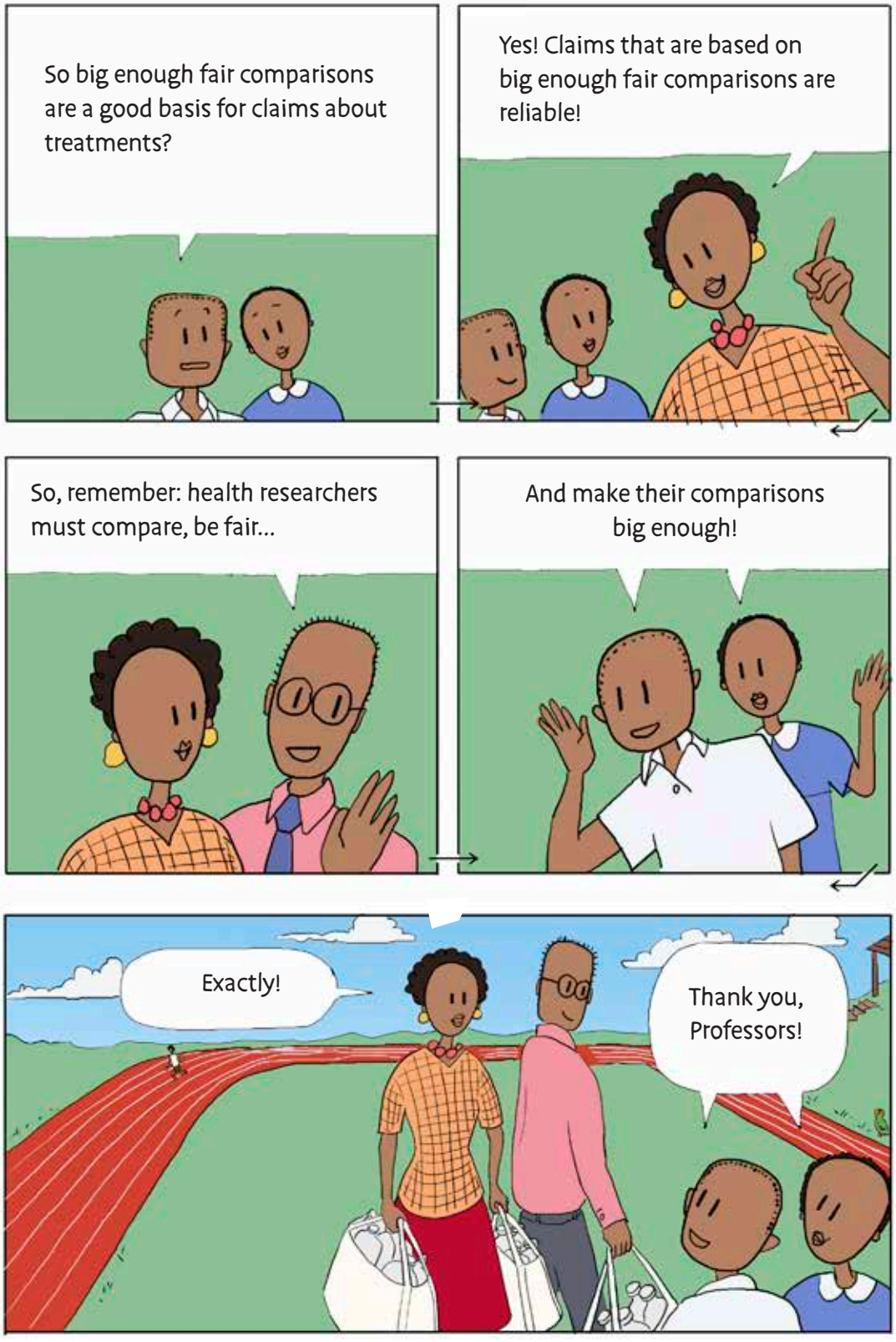

2
Second fair comparison with 100 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
And then the students run.


Then we measure what happened.
GROUP A
This time, **20** out of 50 students in Group A got stomach pain.
GROUP A
GROUP B
And **10** out of 50 students in Group B got stomach pain!
That is almost the same as what we found in the first comparison with 100 students!
STOMACH PAIN COMPARED TO DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1
2
1
1
3
1
18
11
20
10

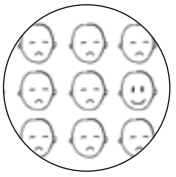

3
Third fair comparison with 100 runners
First, we make the groups!
Group A
Group B
Then we give the treatments to the students!
And then the students run.


Then we measure what happened.
This was the last comparison. This time, 22 of 50 students in Group A got stomach pain.
GROUP A
GROUP B
And 9 out of 50 students in Group B got stomach pain!
We found almost the same thing every time when there were 100 students!
It was the runners in Group A who drank the juice.
DRINKING WATER ?
Number of people with pain:
GROUP A
GROUP B
1 2
1 1
3 1
1 18 11
2 20 10
3 22 9


So, when the comparisons were small, you found something different each time.
GROUP A
Pain: I
GROUP B
Pain: II
But when they were big, about ten more runners out of 50 who drank juice got stomach pain compared to those who drank water.
GROUP A
GROUP B
The more times that you find the same thing, the more sure you can be that it was because of the treatments!
And it was not by chance!
And to find something many times, health researchers must make fair comparison with many people!
Exactly! The fair comparisons must be big enough!


So big enough fair comparisons are a good basis for claims about treatments?
Yes! Claims that are based on big enough fair comparisons are reliable!
So, remember: health researchers must compare, be fair...
And make their comparisons big enough!
Exactly!
Thank you, Professors!

ACTIVITY

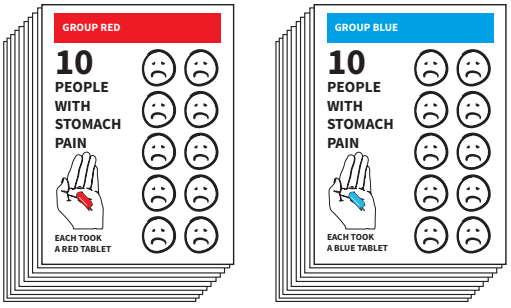


Instruction

Objective: Explain how comparisons with few people can be misleading

Step 1: The children imagine that they are health researchers. The teacher has two sets of 10 papers. One set is red and the other is blue. Children imagine that each set is a group of people in their comparison.

On the front of each paper, there are 10 sad faces. The sad faces are people who have stomach pain. That means there are 100 people with stomach pain in each of the two groups.

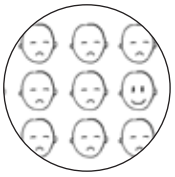


Step 2: The children imagine they have given a red tablet for stomach pain to people on the red papers. These people are in Group Red. They imagine they have given a blue tablet for stomach pain to people on the blue papers. These people are in Group Blue.

The people have used their treatments, so now the children can measure what happened.

More instructions →

ACTIVITY



Step 3: Led by the teacher, the children measure what happened to 10 people in each group.

The teacher chooses two children. One child turns over the top red paper to show the back. The other child turns over the top blue paper. On the back of each paper, some of the faces are smiling. Each smiling face is a person who no longer has stomach pain.

Step 4: The teacher and children count how many people in each group no longer have stomach pain. In the chart in their exercise book, each child writes how many people in each group no longer have stomach pain. The teacher writes how many in a chart on the board.

Step 5: Led by the teacher, children discuss which tablet seems best to take if you have stomach pain.

Step 6: The teacher and children repeat Steps 2 to 4 until they have turned over all the papers

Step 7: When all the papers have been turned over, led by the teacher, children discuss whether the same tablet seemed best at the beginning of the activity as at the end.

EXERCISE 1

Tick whether each point is true or false.

Example:
In a fair comparison, the groups are similar.

☑ True ☐ False

1. In fair comparisons, health researchers can be more sure why something happens when it happens many times.

   ☐ True ☐ False

2. If a comparison is big enough, it is not important whether it is fair.

   ☐ True ☐ False

3. Most of the time, health researchers should make more than one fair comparison of the same treatments.

   ☐ True ☐ False

EXERCISE 2

Remember that the two meanings of “by chance” are in the back of the book

1. What does it mean to choose “by chance” who gets which treatment?

2. What does it mean to find something “by chance” in a comparison that was too small?