Adventures of Beta and Bit

How to weigh a dog with a ruler?

Beta, who has a passion for mathematics, chess and good books, changes into SuperBeta under the influence of puzzles.

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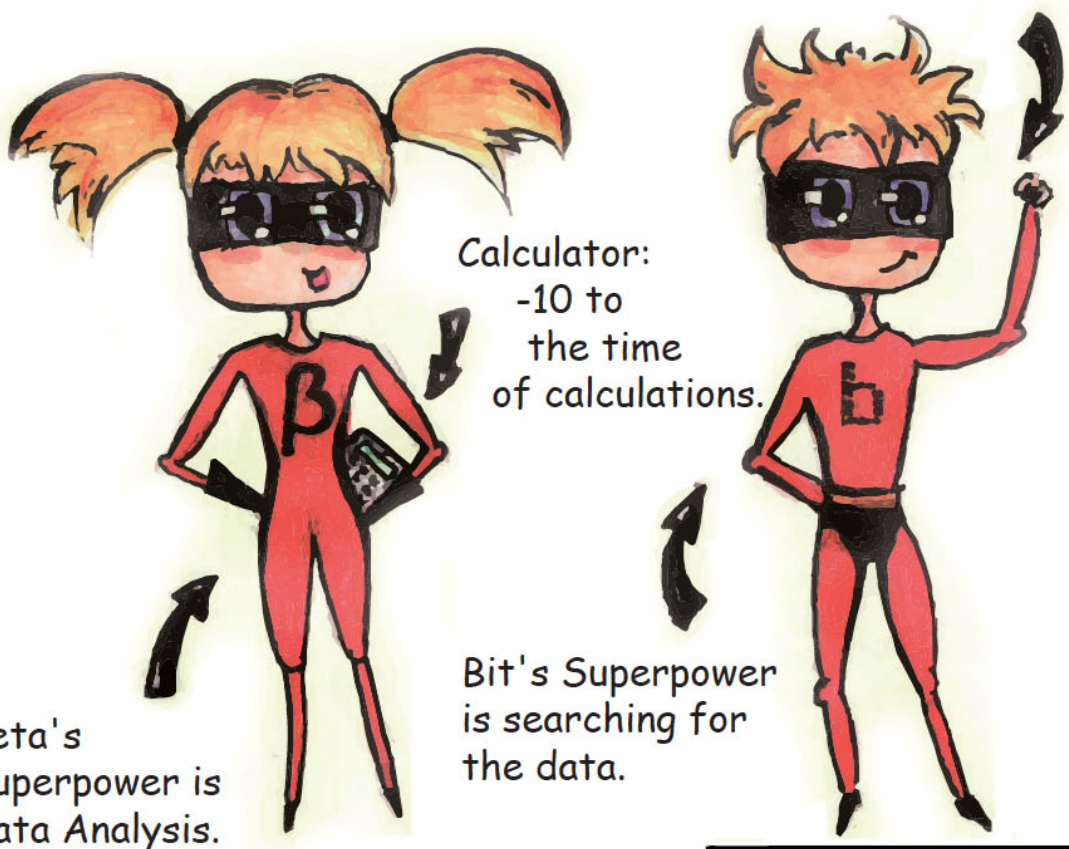
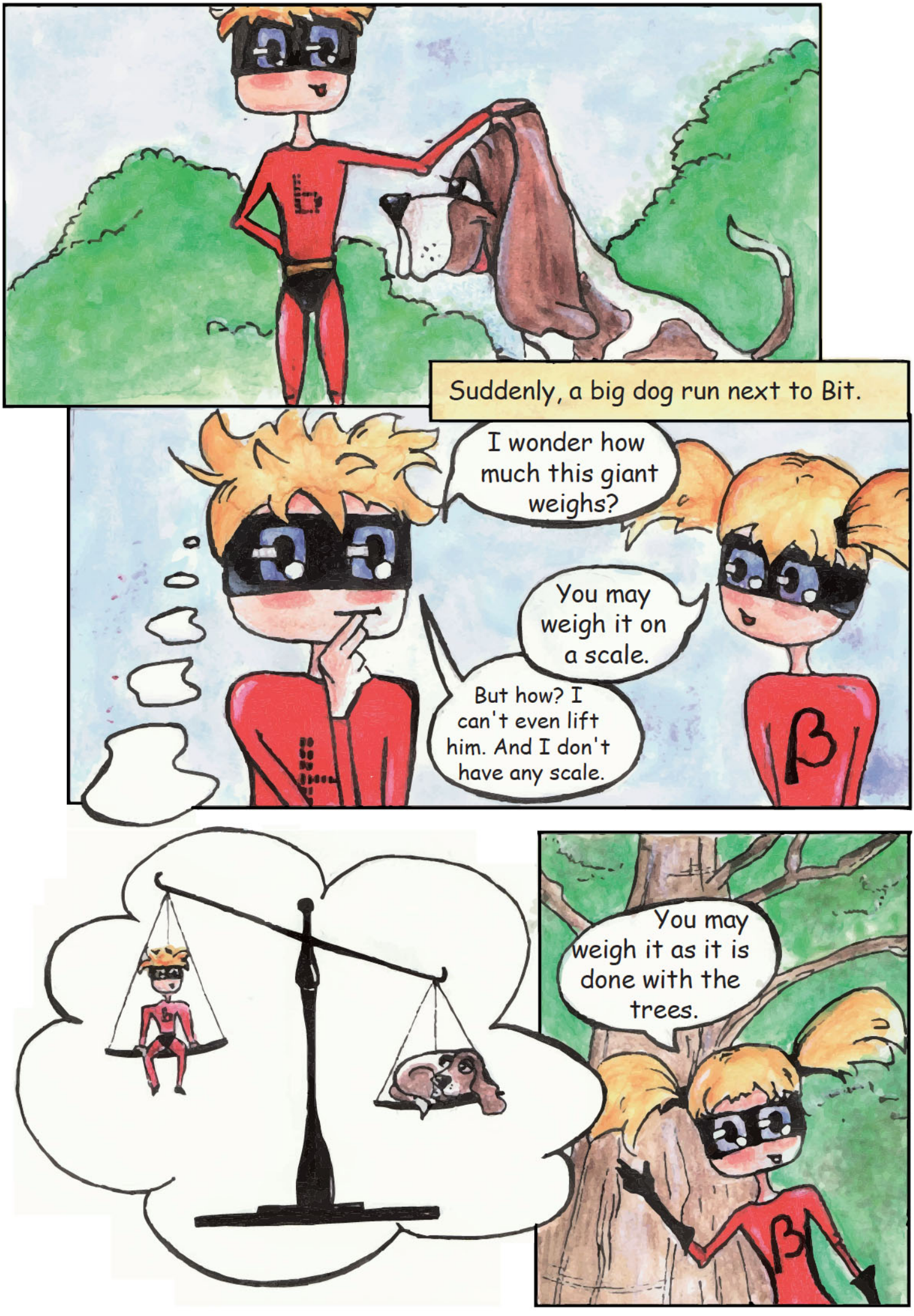


Bit, who is a computer, programming as well as robot maniac, changes into SuperBit under the influence of puzzles.

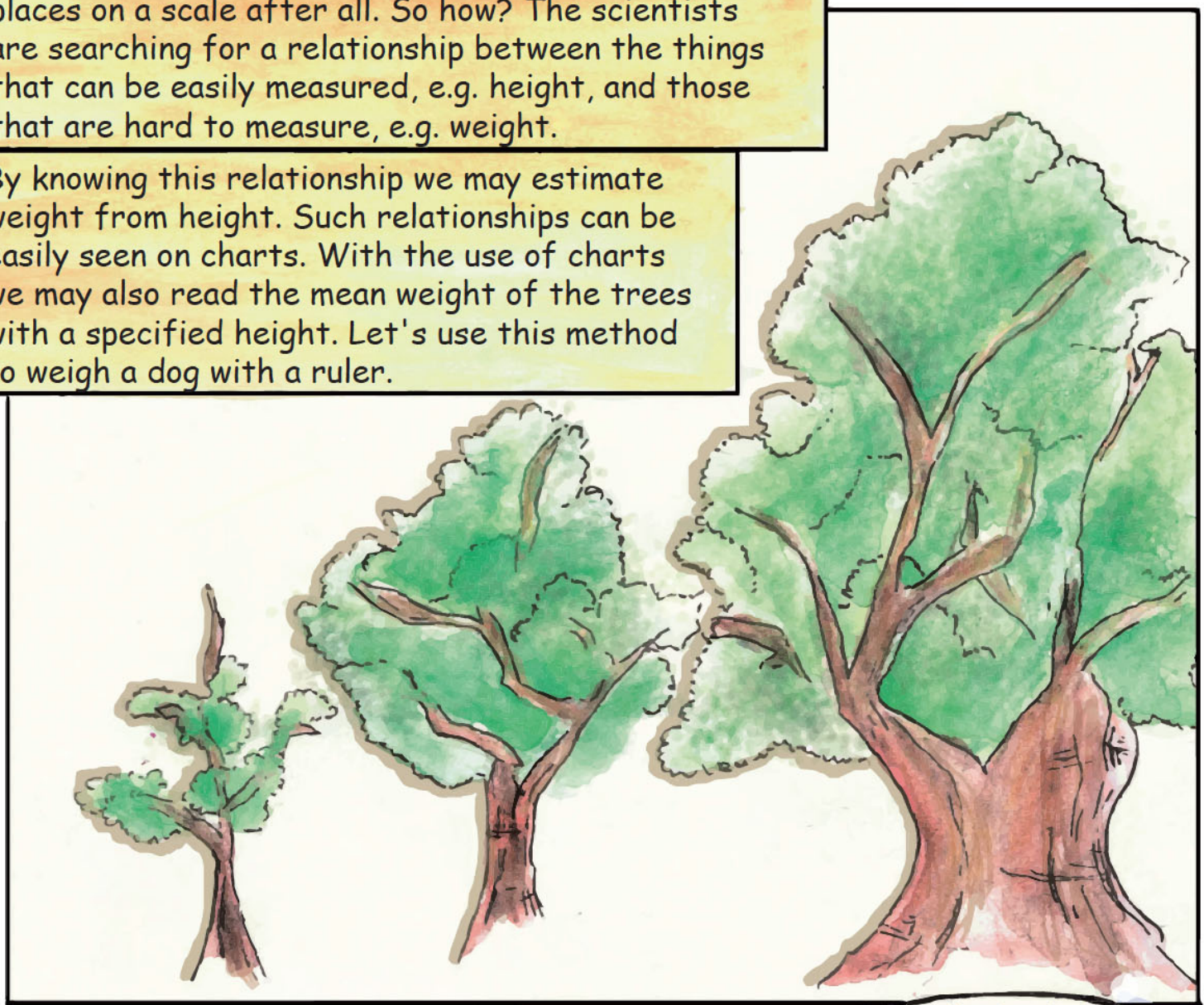
The early spring: Beta and Bit are wandering through the park.

This publication is co-financed by the means granted by Foudation for the Polish Science in the eNgage program as part of the SKILLS project co-financed by The European Social Fund (contract nr 71/UD/SKILLS/2015).


Suddenly, a big dog run next to Bit.
I wonder how much this giant weighs?
You may weigh it on a scale.
But how? I can't even lift him. And I don't have any scale.
You may weigh it as it is done with the trees.

How to weigh huge trees? Nobody digs them and places on a scale after all. So how? The scientists are searching for a relationship between the things that can be easily measured, e.g. height, and those that are hard to measure, e.g. weight.

By knowing this relationship we may estimate weight from height. Such relationships can be easily seen on charts. With the use of charts we may also read the mean weight of the trees with a specified height. Let's use this method to weigh a dog with a ruler.

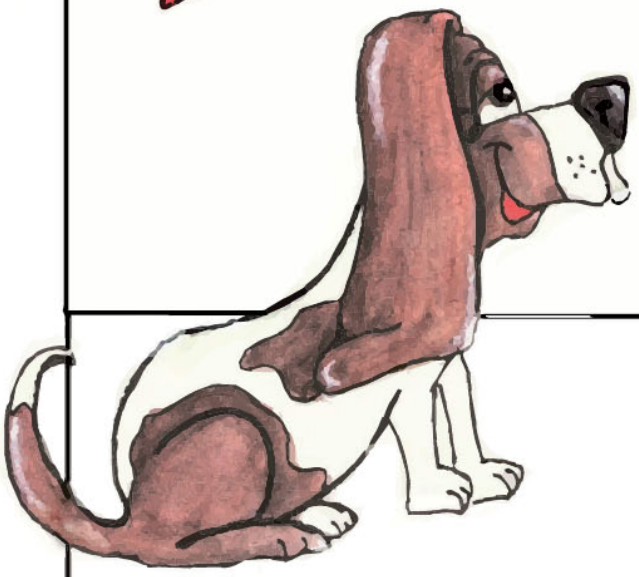


Take a ruler and a pencil. We will weigh a dog with a ruler in only three steps!

1

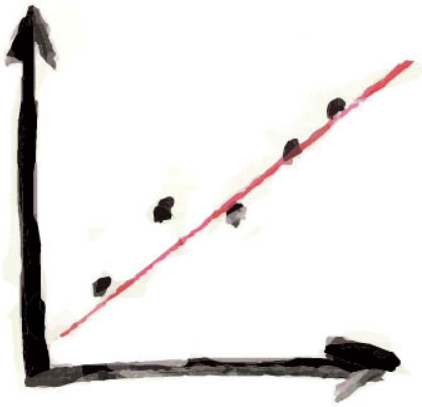
Bit found a table with different dog breeds' data on the Internet. Now, **you should mark on the chart on your right the weight and height of breeds**, mentioned in the table.

	Weight [cm]	Height [kg]
Chihuahua	20	2,7
Yorkshire	22	3
Terier	40	13
Bearded collie	55	28
Chow Chow	55	31
Akita	70	50
Newfoundland	71	70
Mastiff	80	90



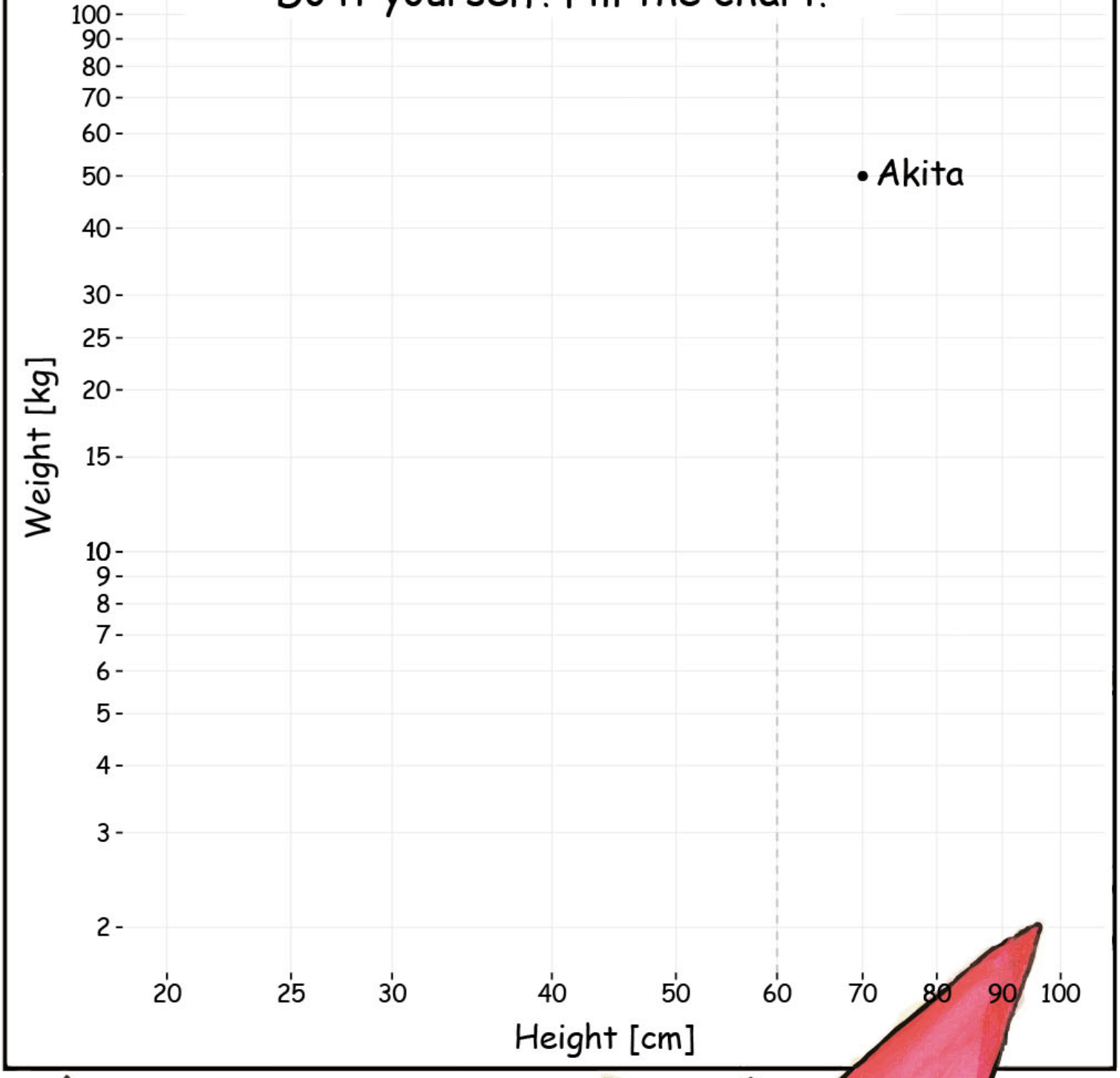
2

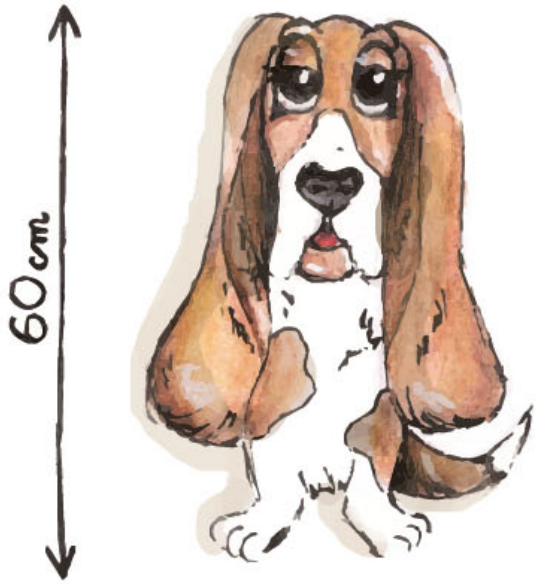
Take a ruler and try **to draw a line which is passing the nearest possible by all the points.** It doesn't have to go through all possible points but try to make it the closest possible (*).



(*) The mathematics on the academic level is needed to find the line which fits the best. In this way we will find more or less aproximate solution.

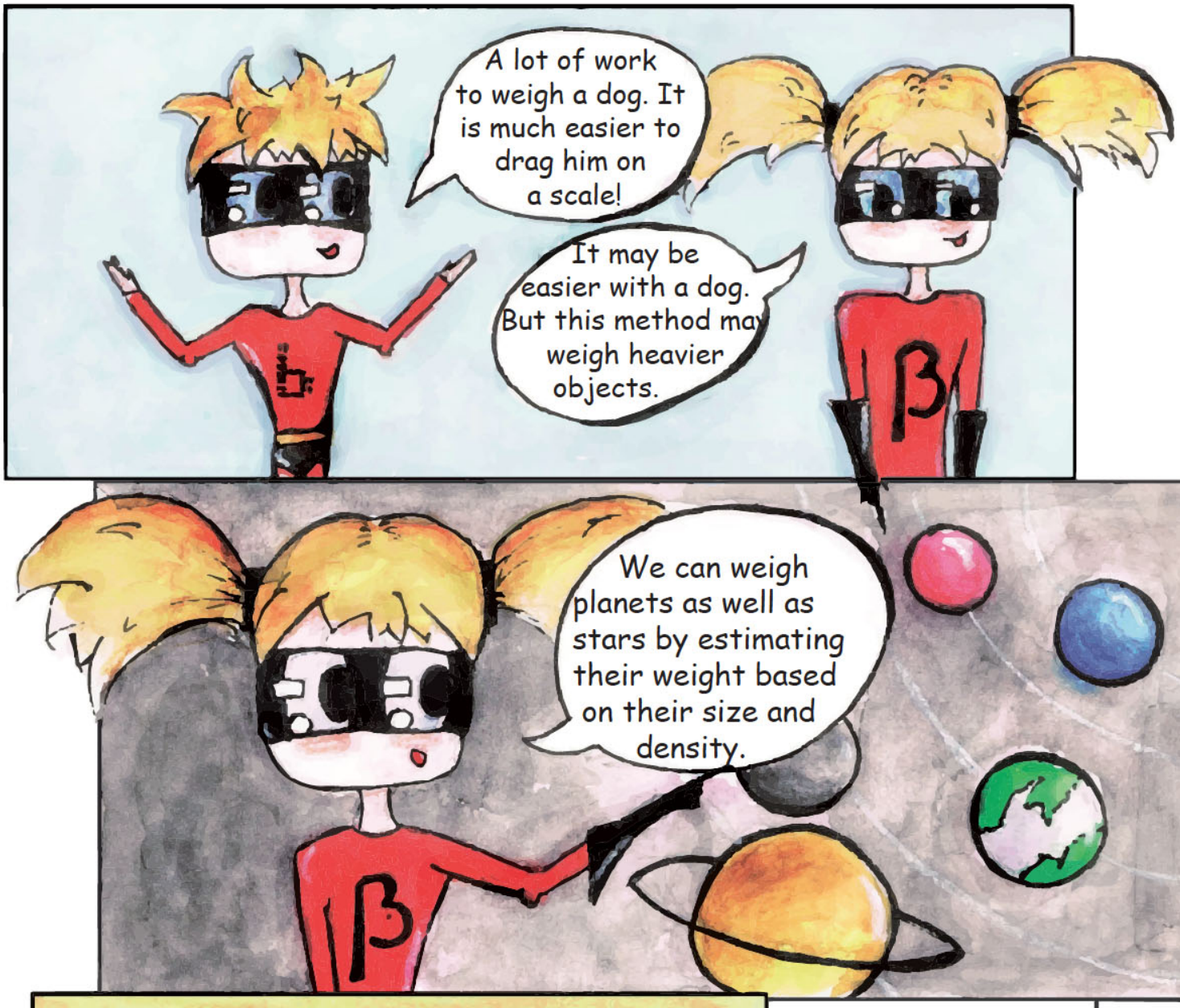
Do it yourself! Fill the chart!



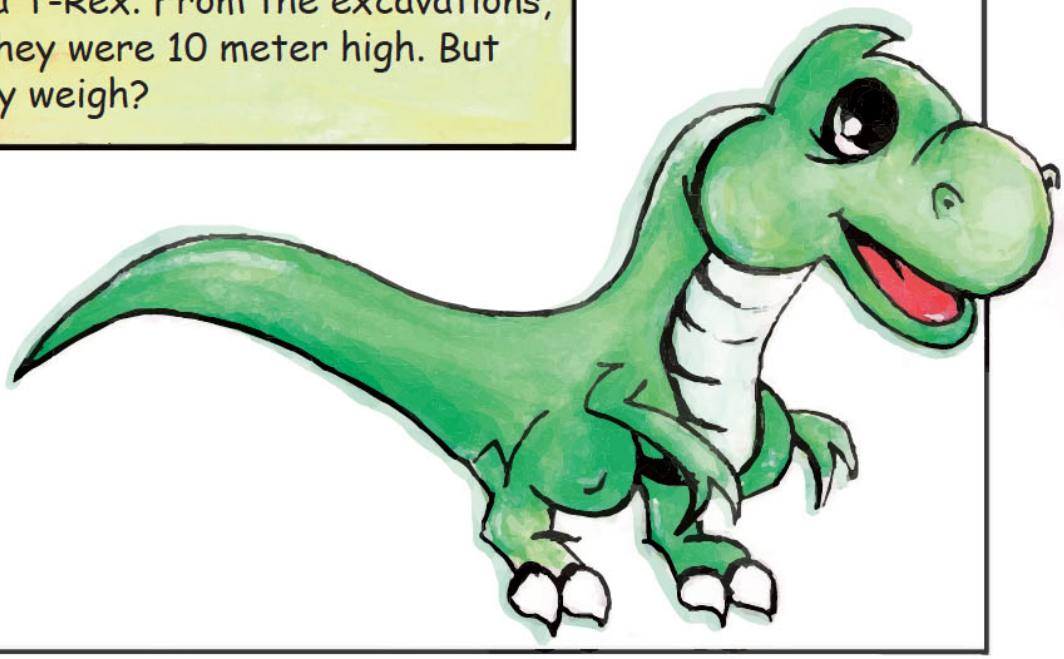


3

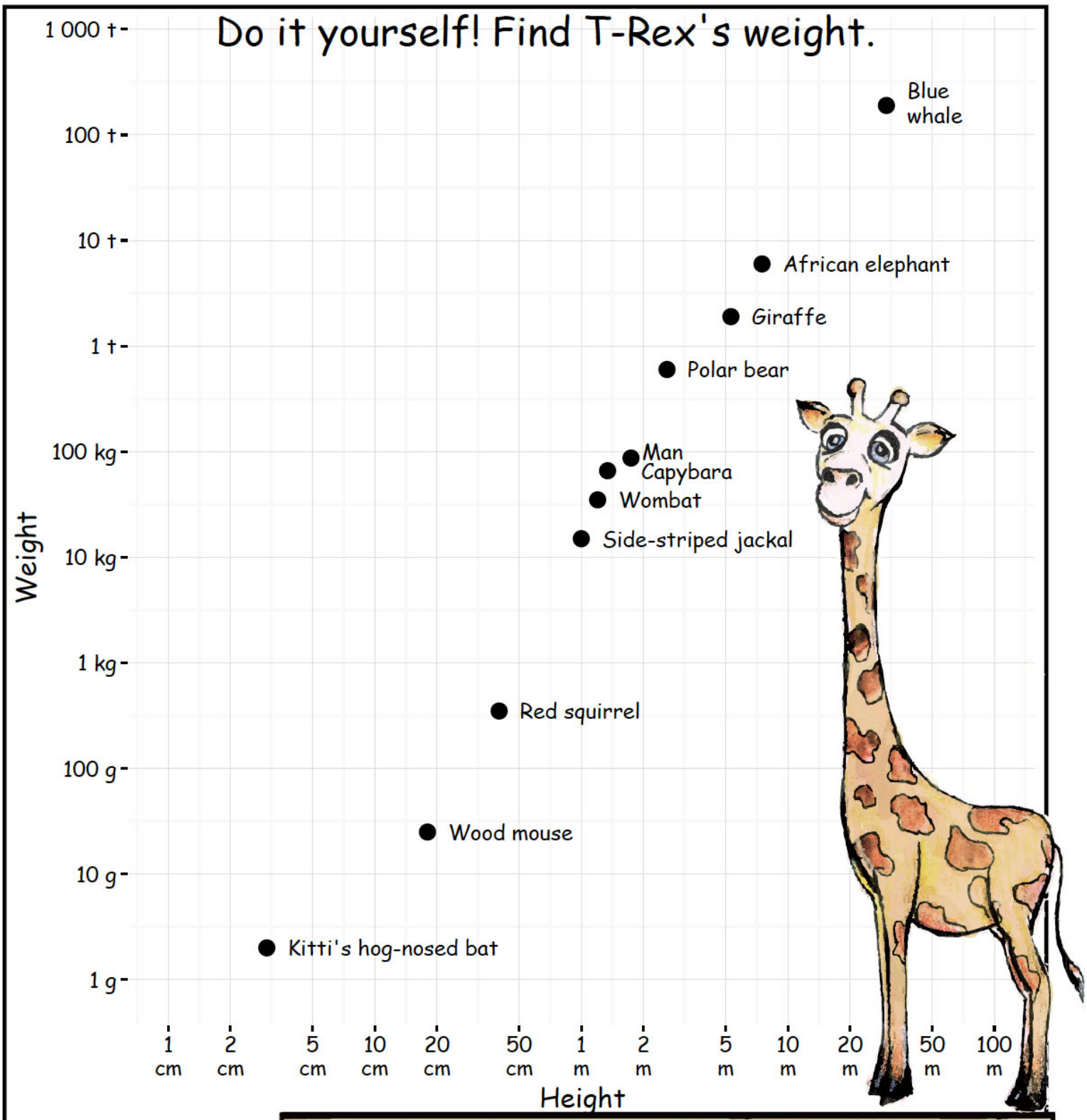
How heavy is 60 cm high dog? (1) Mark this size on the horizontal line. (2) Draw a vertical line through it. (3) Try to read what weight the height of the dog corresponds to. What is your result?



We can weigh dinosaurs too, in spite of the fact that they died out a long time ago and today we have only their skeletons or imprints on a rock. Let us take such a T-Rex. From the excavations, it is known that they were 10 meter high. But how much did they weigh?



Do it yourself! Find T-Rex's weight.

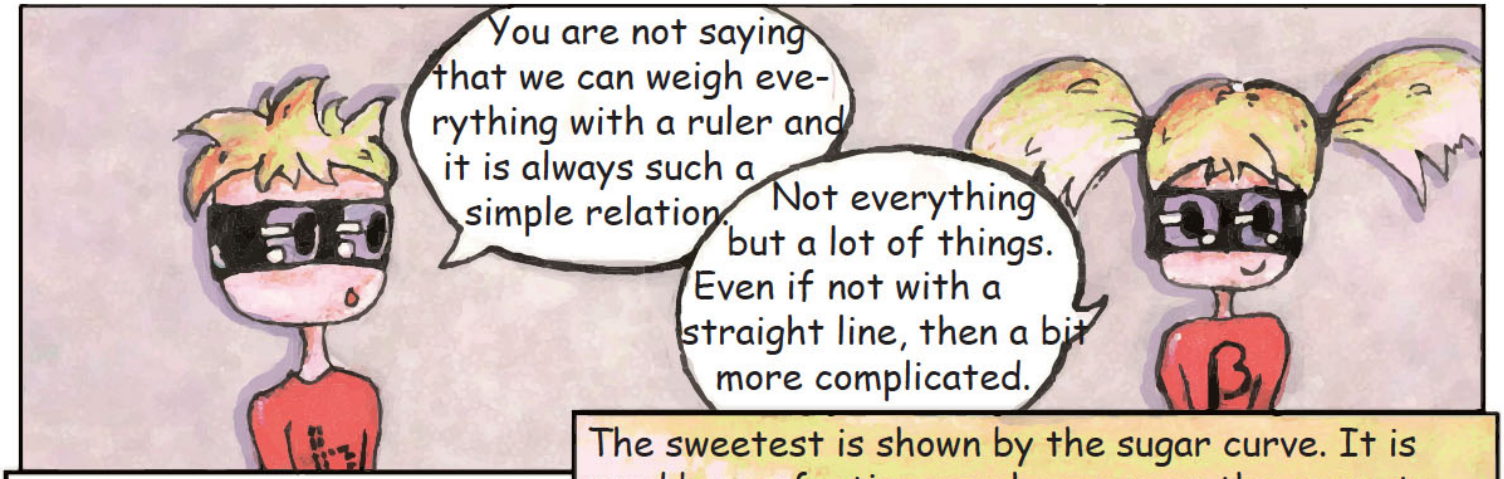


On the above-mentioned chart it was marked the height and weight of different animals. From a small bat to a giant whale. Having such a combination try to estimate how much the 10 meter dinosaur weighed.

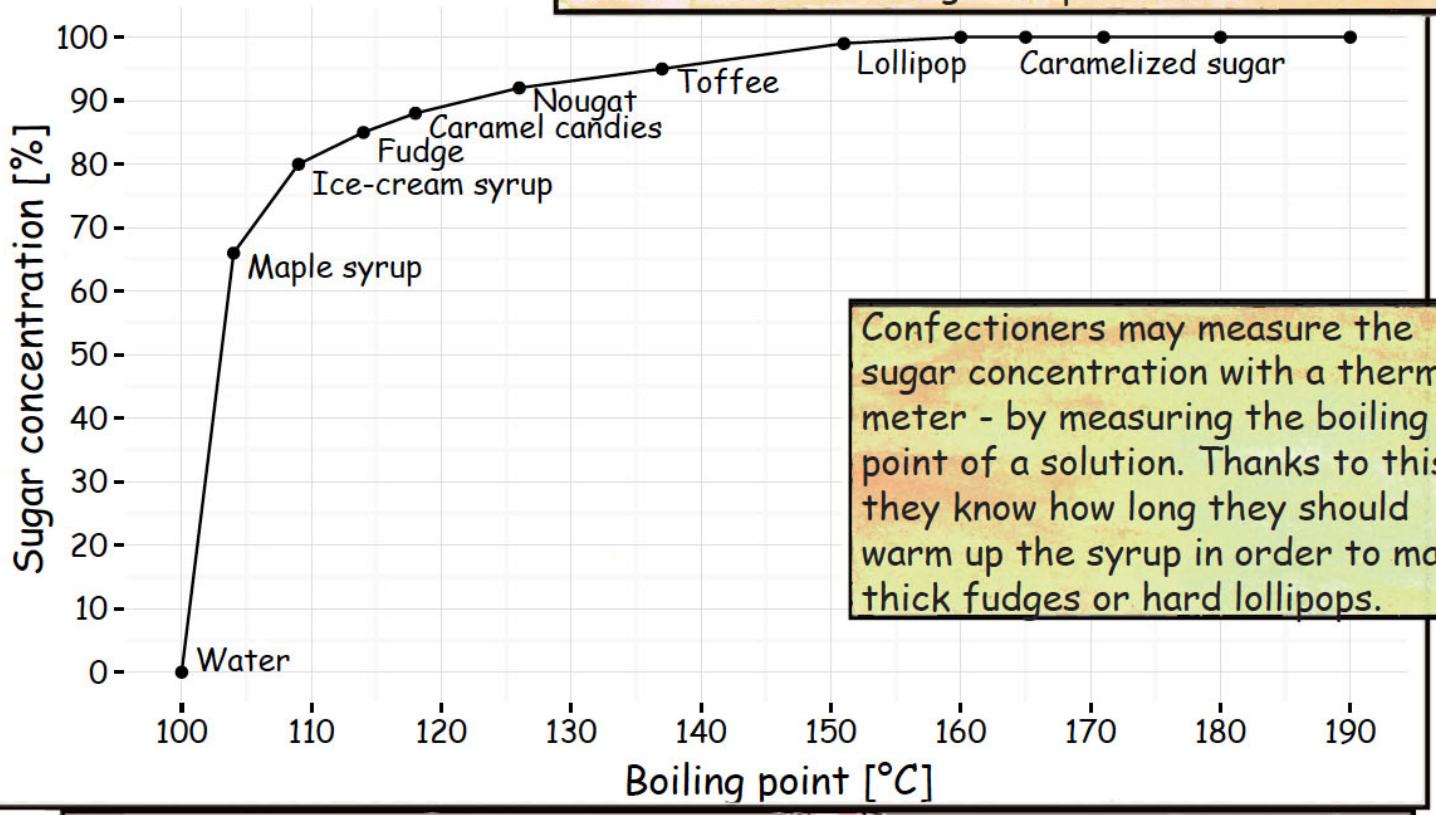
(1) Draw a line passing close to the marked points, as you did for the dogs.

(2) Having such a relationship estimate T-Rex's weight (*), find out what weight corresponds to 10 meters of height.

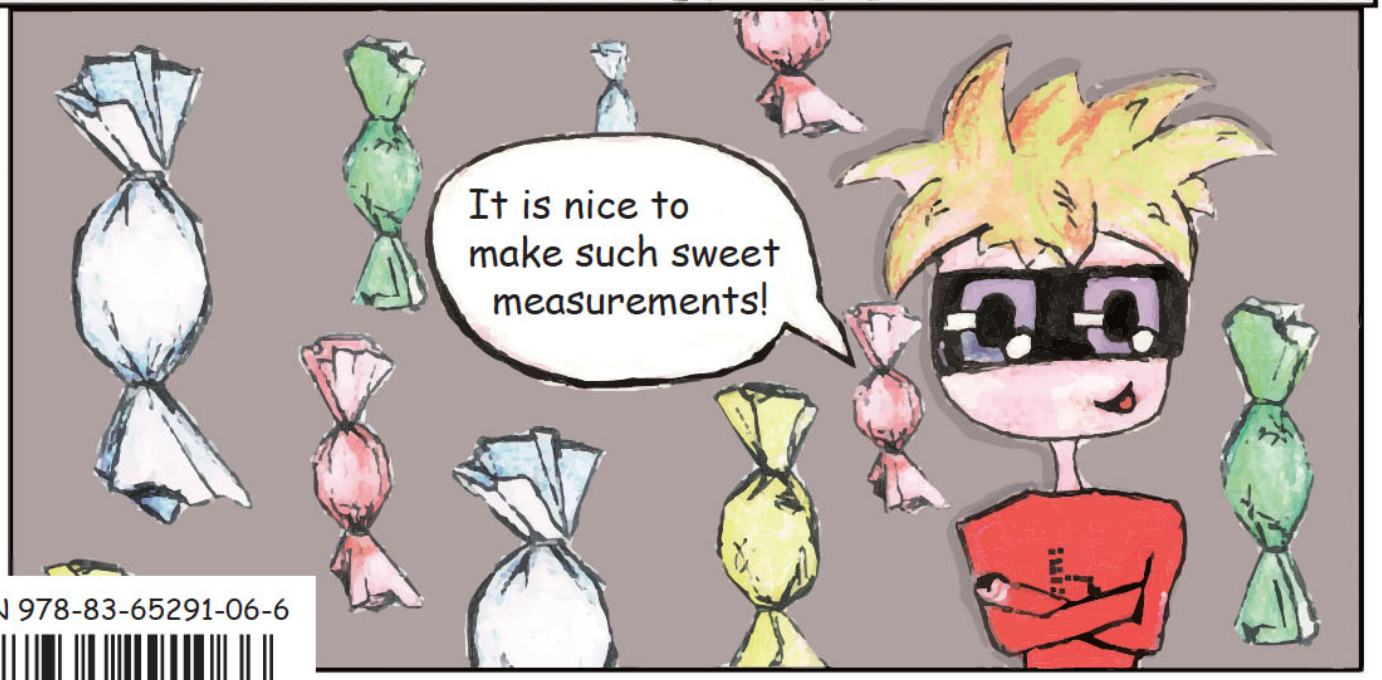
(*) Till nowadays the scientists are not unanimous how much these giants weighed. Different model predictions vary from 4.5 to 10 ton. And what was your result?



The sweetest is shown by the sugar curve. It is used by confectioners who warm up the syrup to the more and more high temperatures.



Confectioners may measure the sugar concentration with a thermometer - by measuring the boiling point of a solution. Thanks to this they know how long they should warm up the syrup in order to make thick fudges or hard lollipops.



ISBN 978-83-65291-06-6
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