

**BOSSES ARE USUALLY
PRETTY DUMB.**

BOSSSES ARE USUALLY PRETTY DUMB.

- **THEY DON'T LISTEN MUCH (EXCEPT TO THEIR BOSSES)**
- **THEY DON'T KNOW MUCH (EXCEPT HOW TO KEEP THEIR BOSSES HAPPY)**
- **THEY THINK THEY KNOW A LOT, EVEN WHEN THEY DON'T**

“JUST GIVE ME THE 10-SECOND VERSION”

“JUST GIVE ME THE 10-SECOND VERSION”

SOME BOSSES ARE

A **LITTLE** LESS DUMB.

“JUST GIVE ME THE 30-SECOND VERSION”

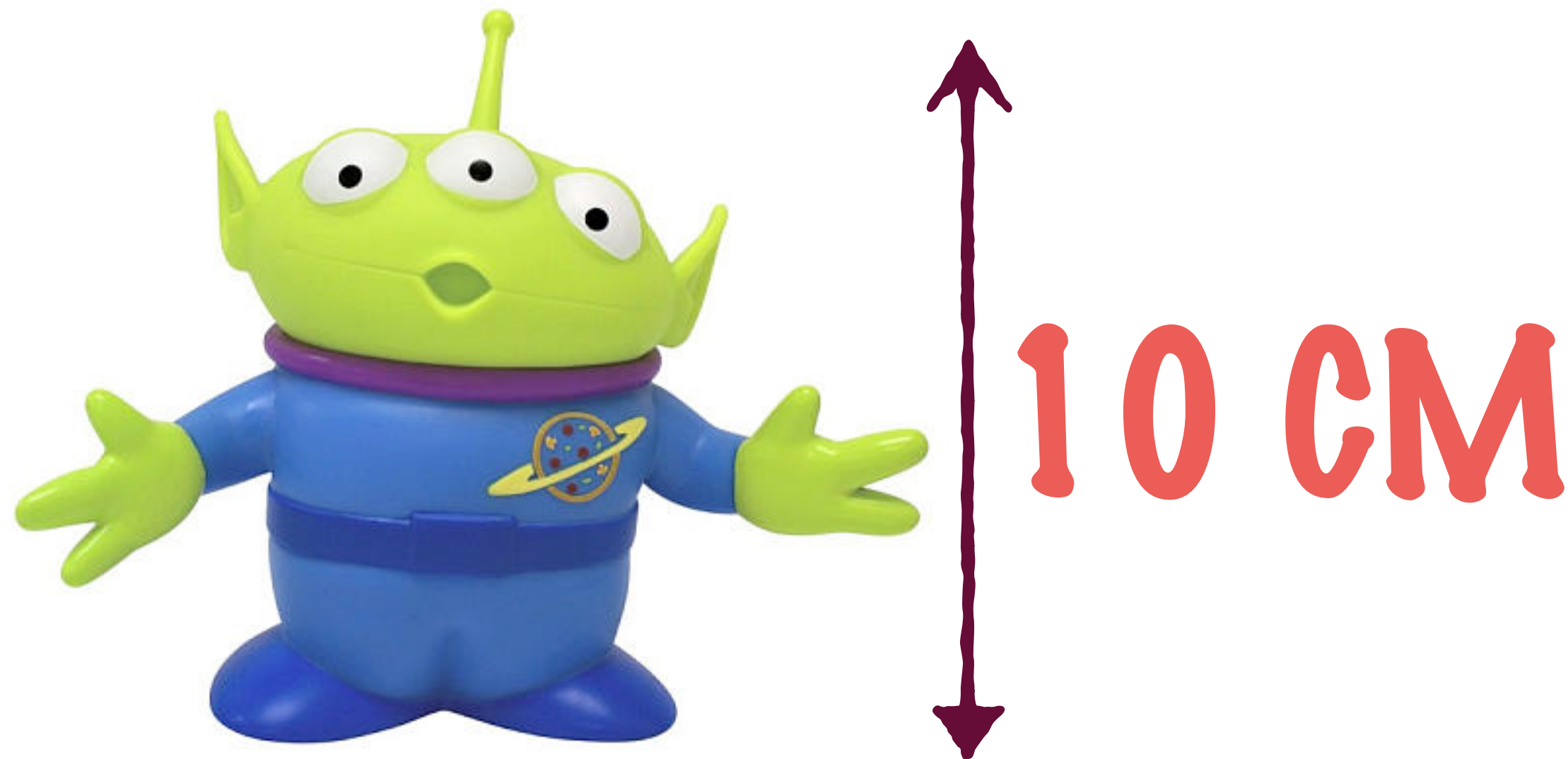
“JUST GIVE ME THE 10-SECOND VERSION”

JUST THE MEAN
WILL DO

“JUST GIVE ME THE 30-SECOND VERSION”

MEAN AND STANDARD
DEVIATION WILL DO IT!

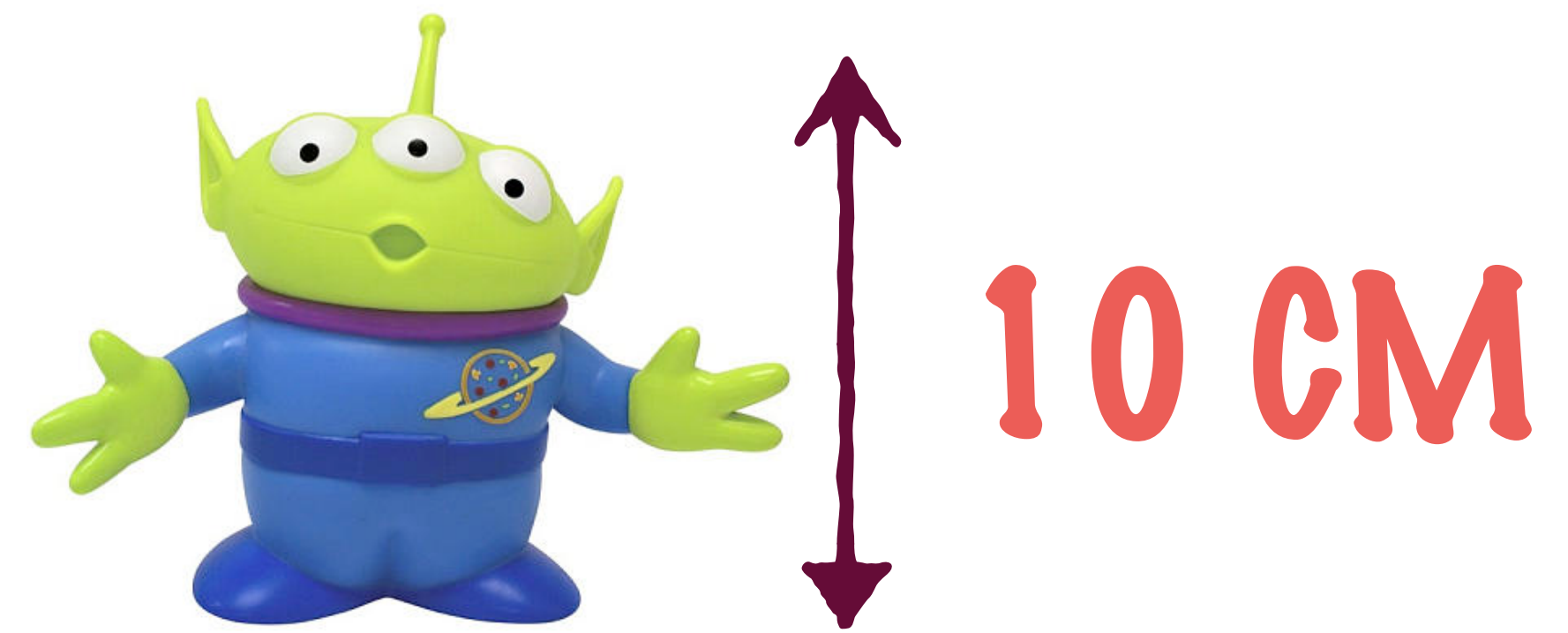
**YOU ARE A TOY
MANUFACTURER**



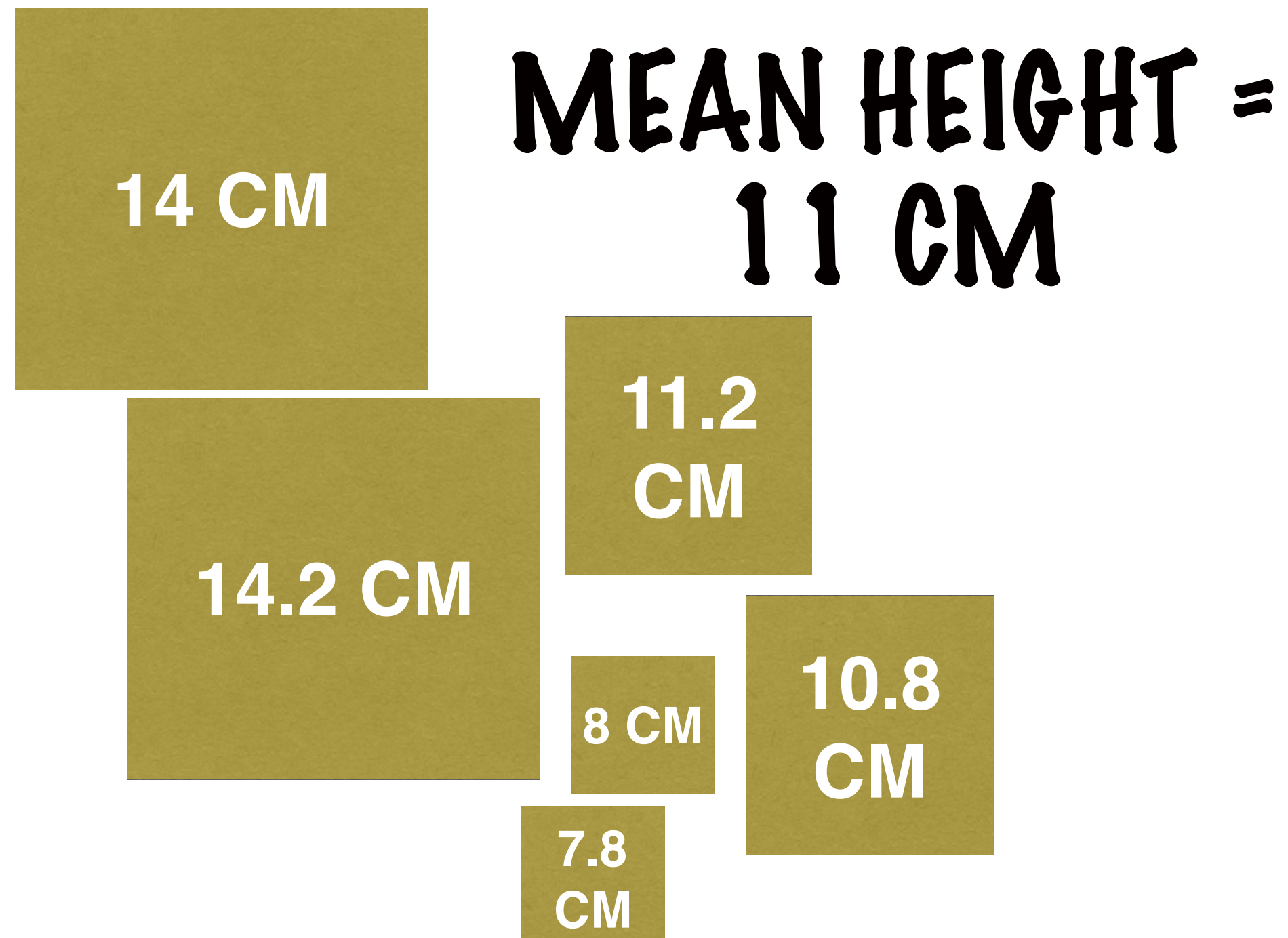
**YOU WANT TO
OUTSOURCE
THE PACKAGING
OF YOUR TOYS**

THERE ARE 2 CONTENDERS

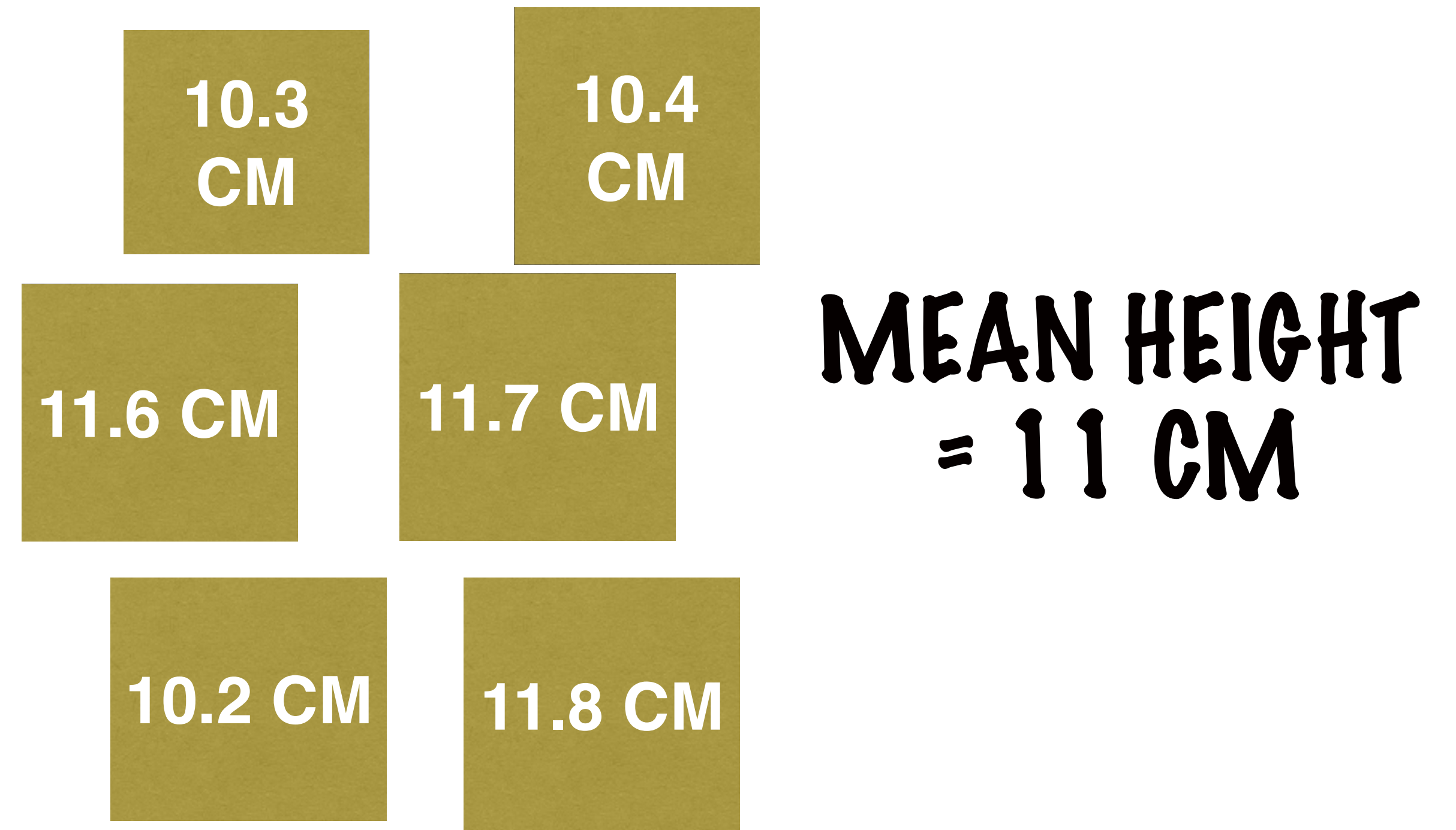
BOTH SENT YOU **SAMPLES**
OF THEIR PACKAGING



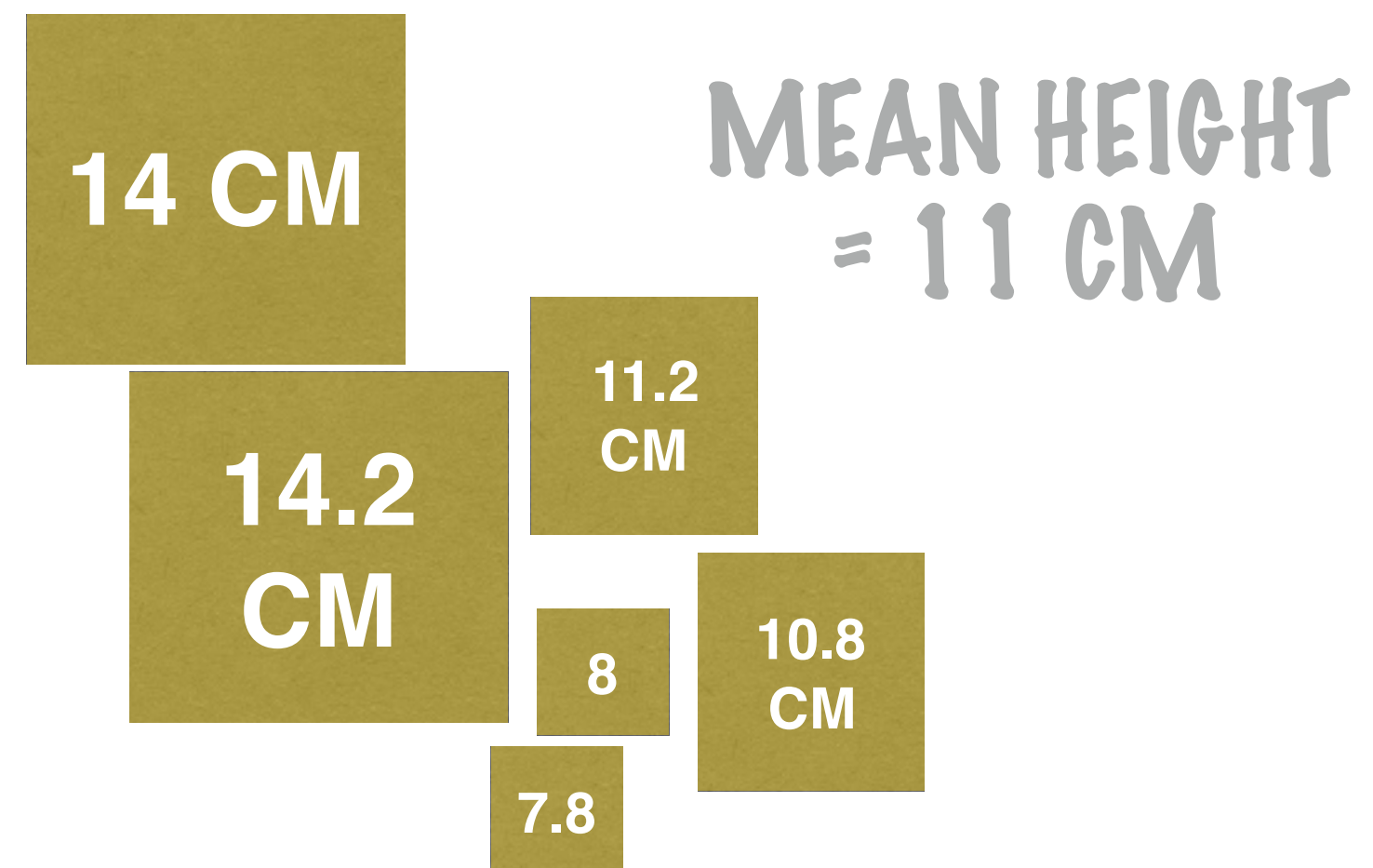
CONTENDER 1 :



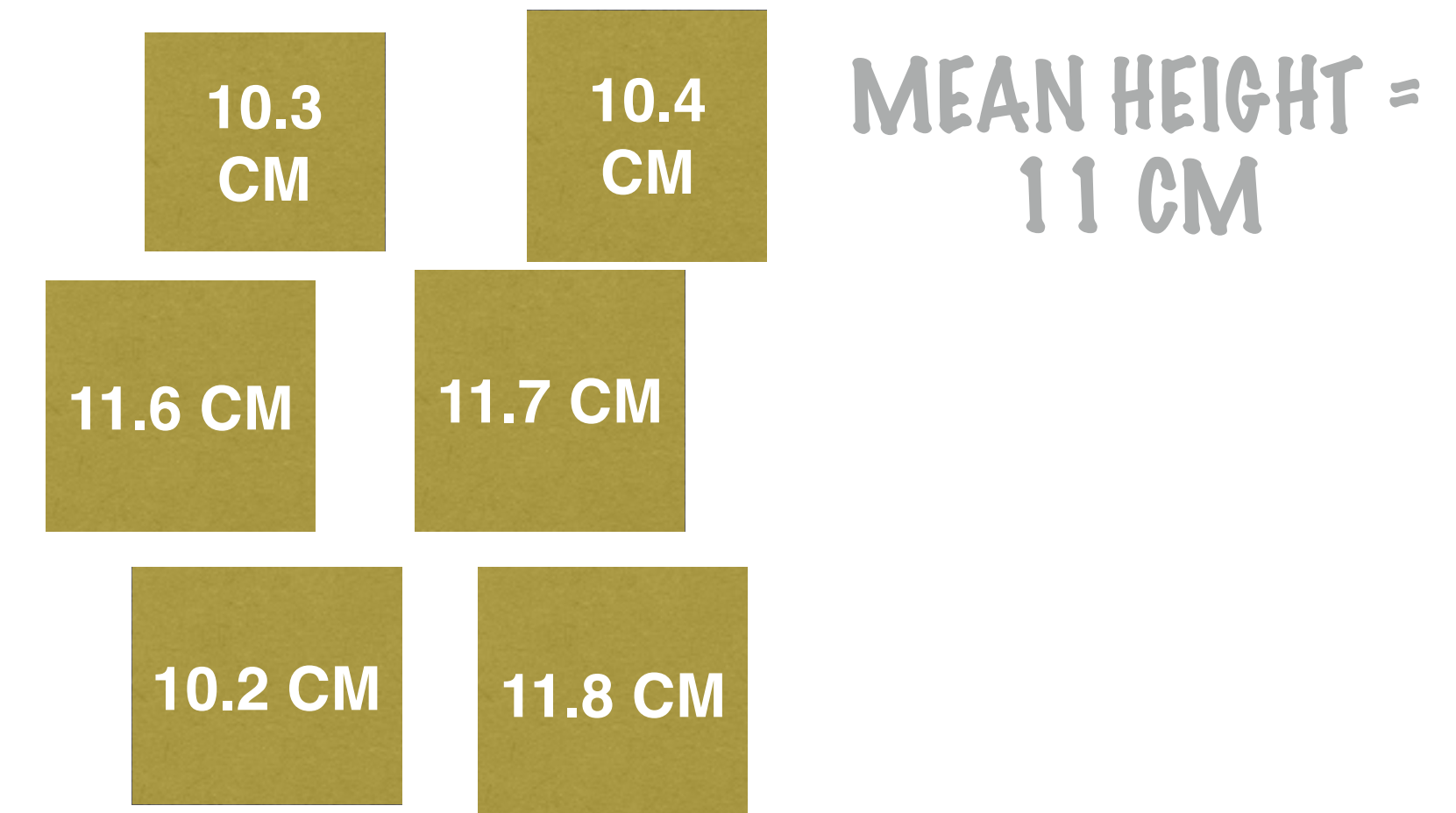
CONTENDER 2 :



CONTENDER 1 :

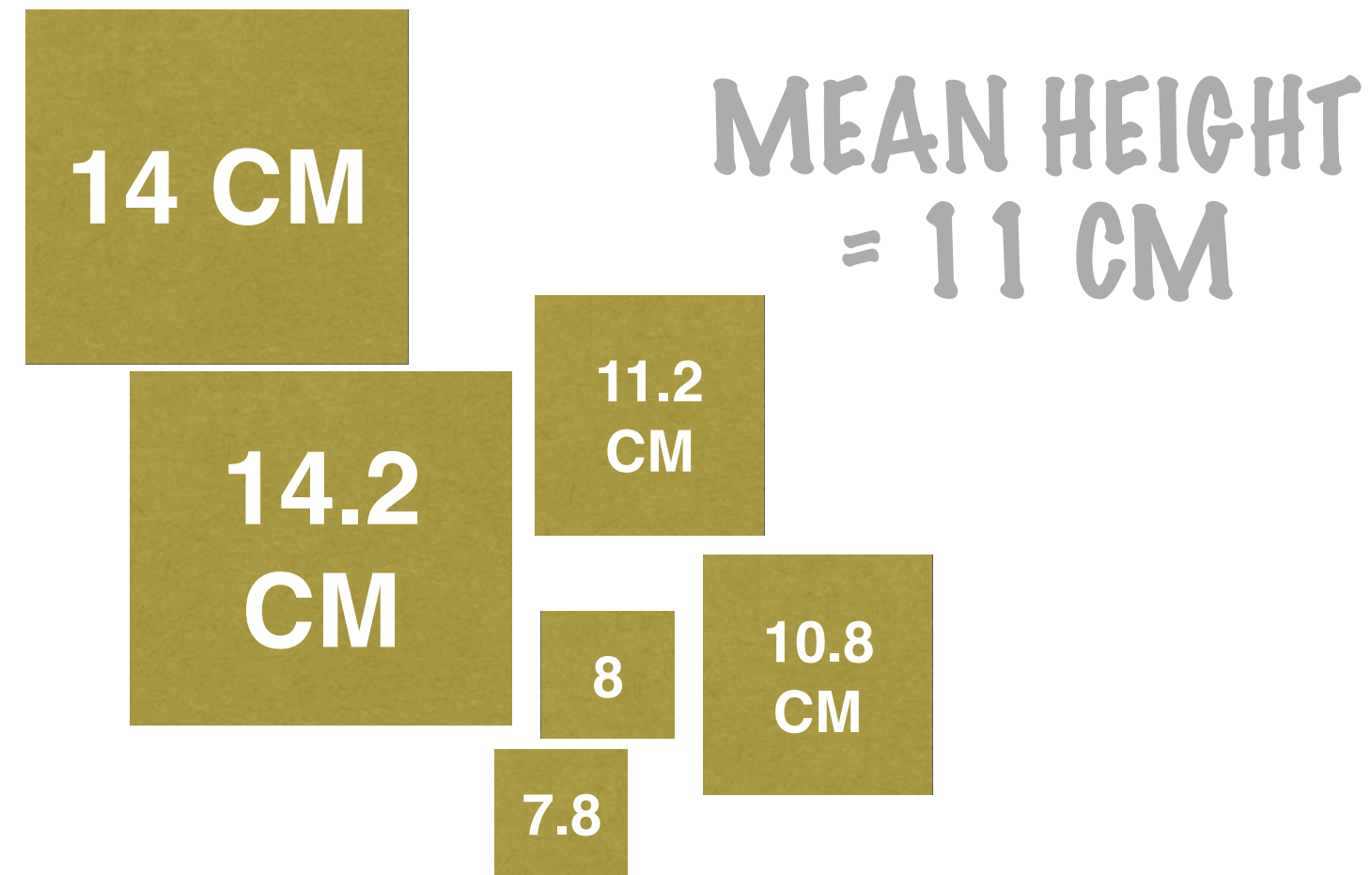


CONTENDER 2 :

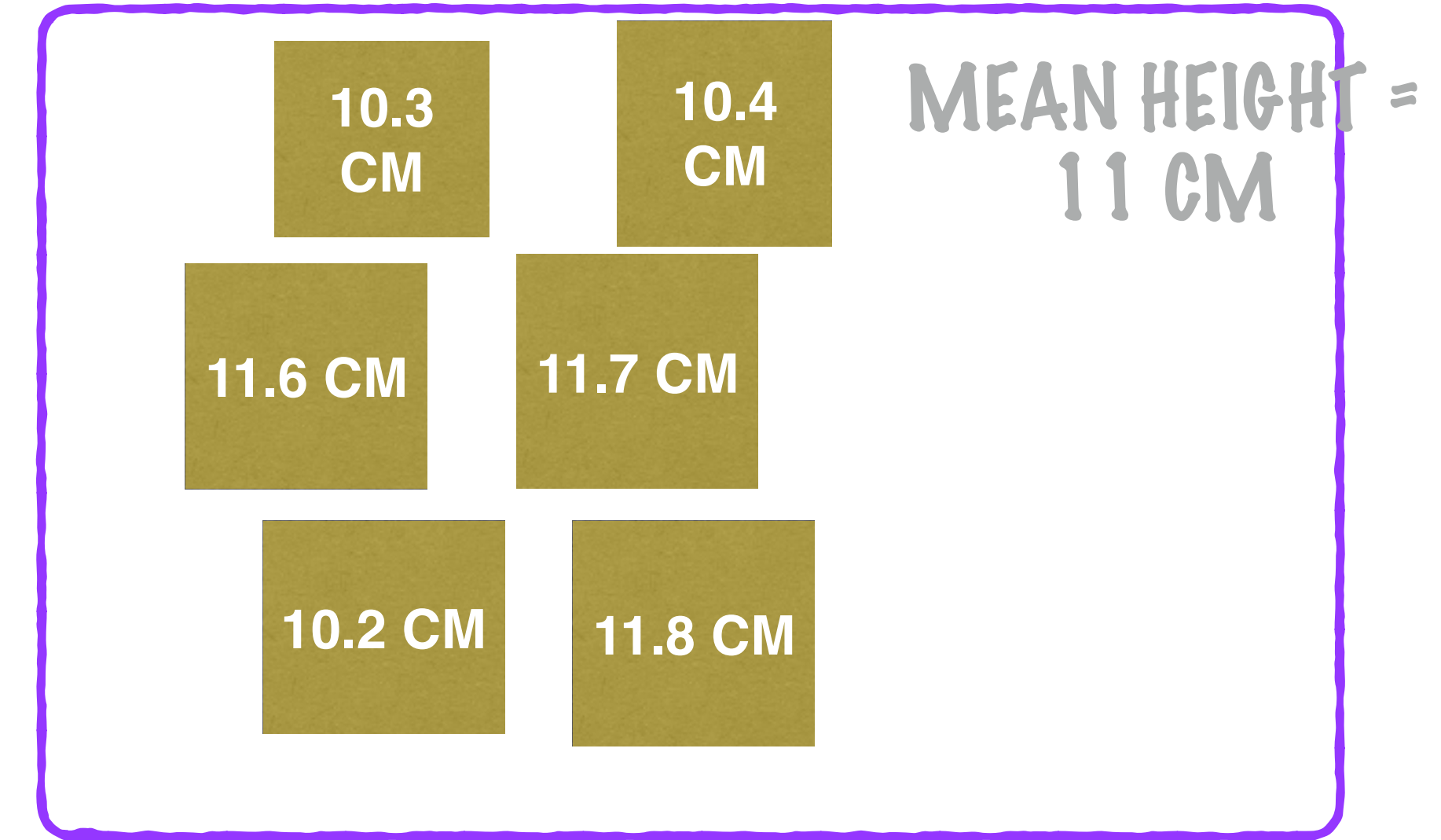


WHICH ONE SHOULD
GET THE CONTRACT?

CONTENDER 1 :



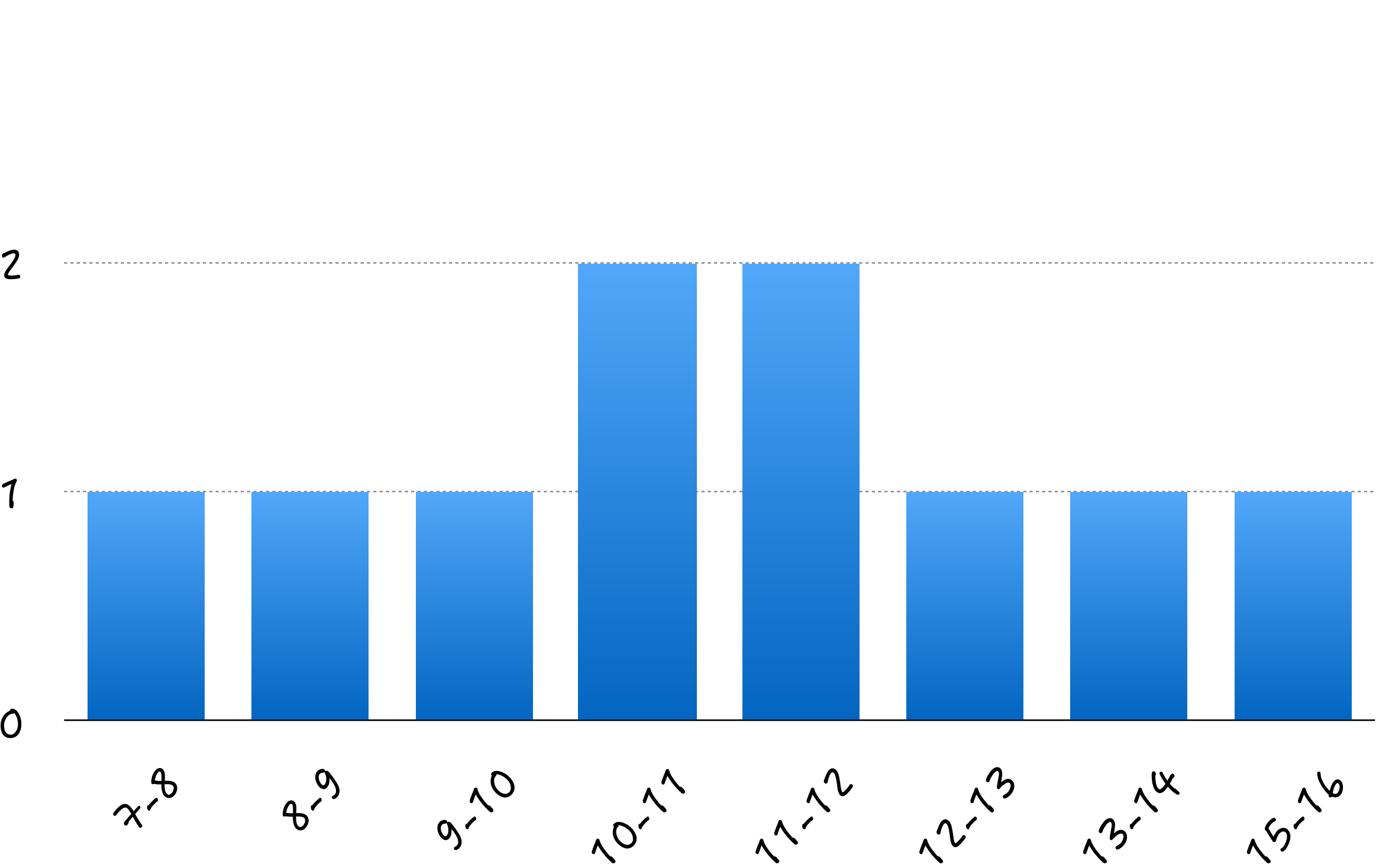
CONTENDER 2 :



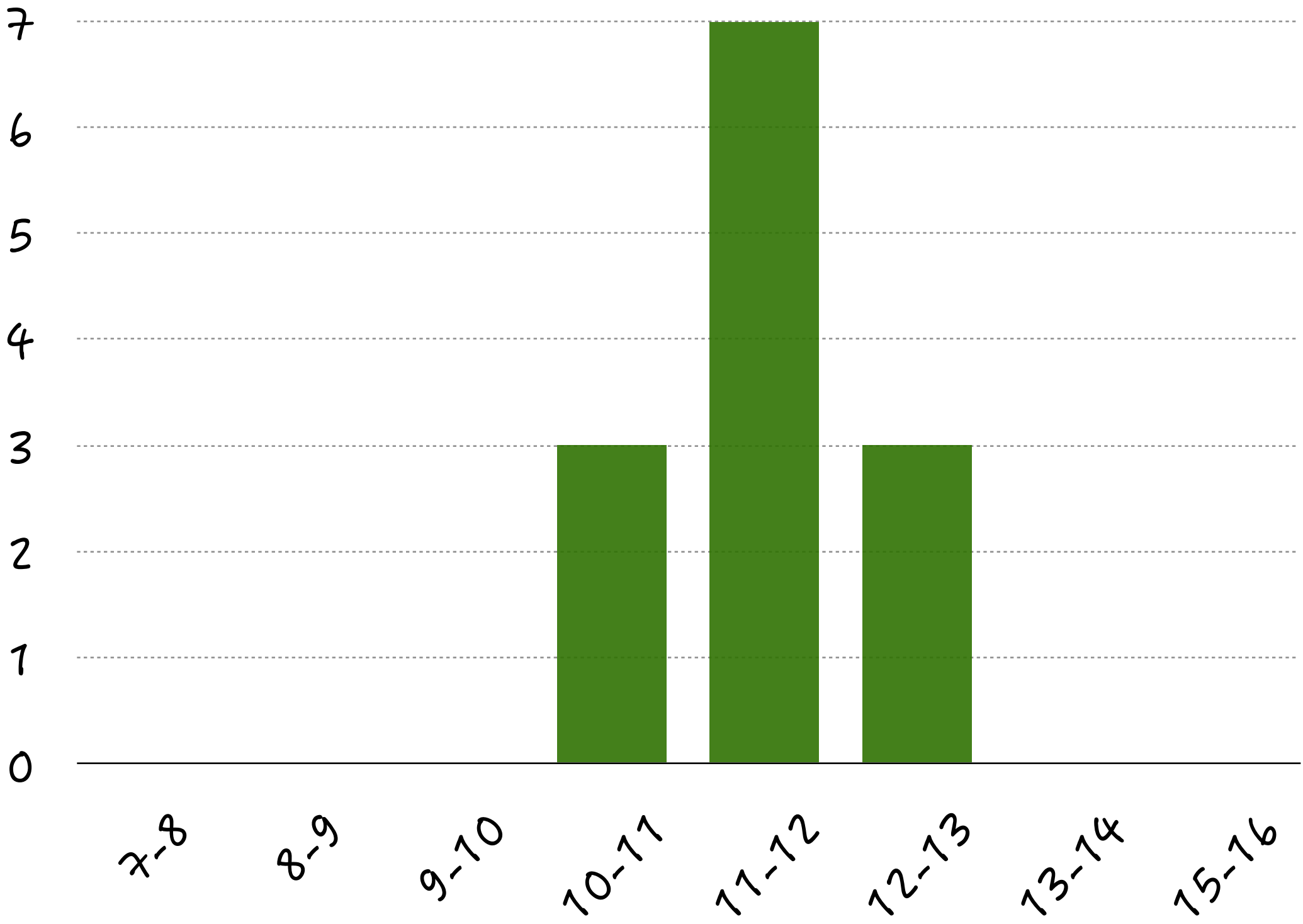
THE "SPREAD" OF CONTENDER 2'S BOXES IS LESSER THAN CONTENDER 1

HERE ARE THE HISTOGRAMS OF THE BOX SIZES FROM EACH CONTENDER

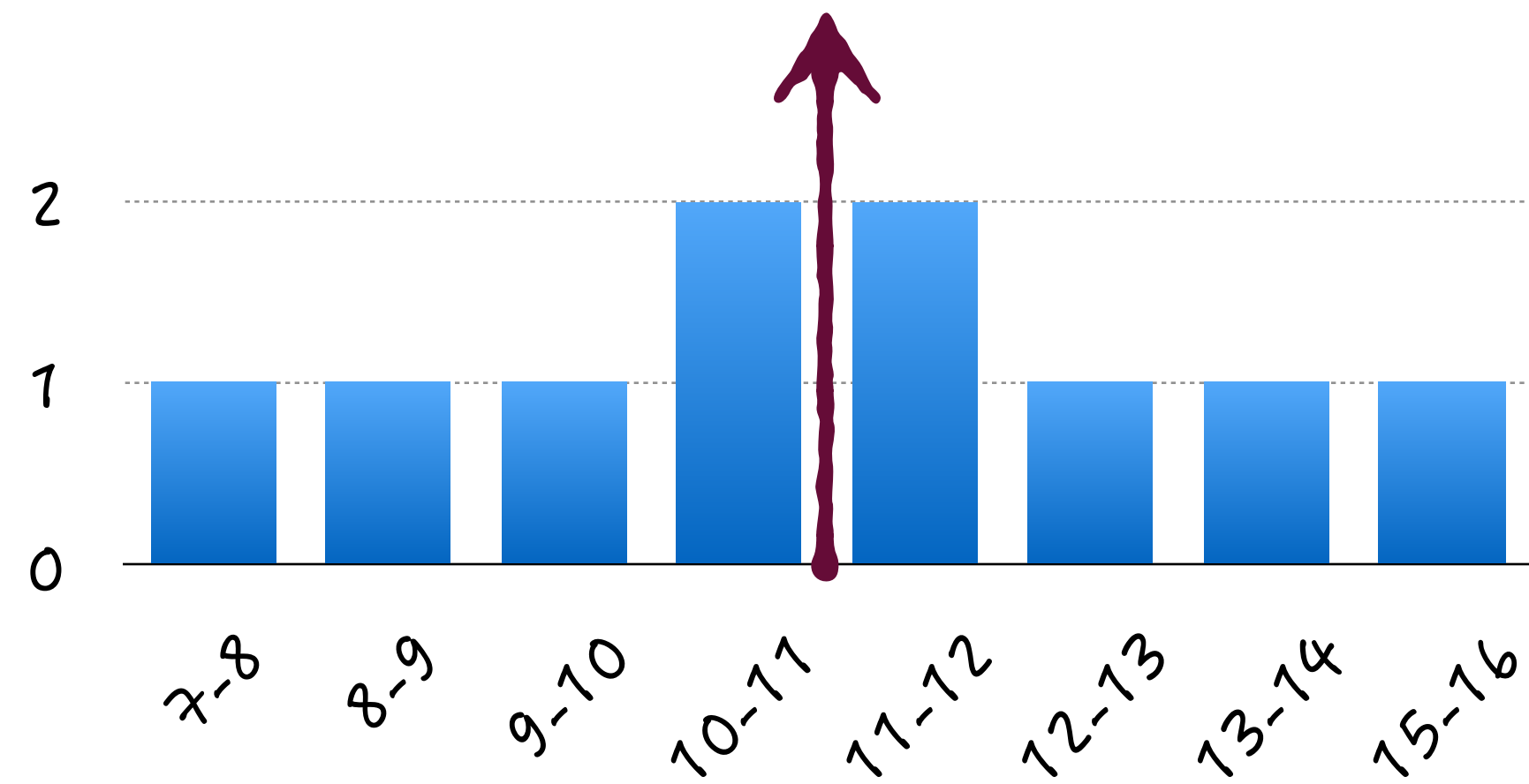
CONTENDER 1 :



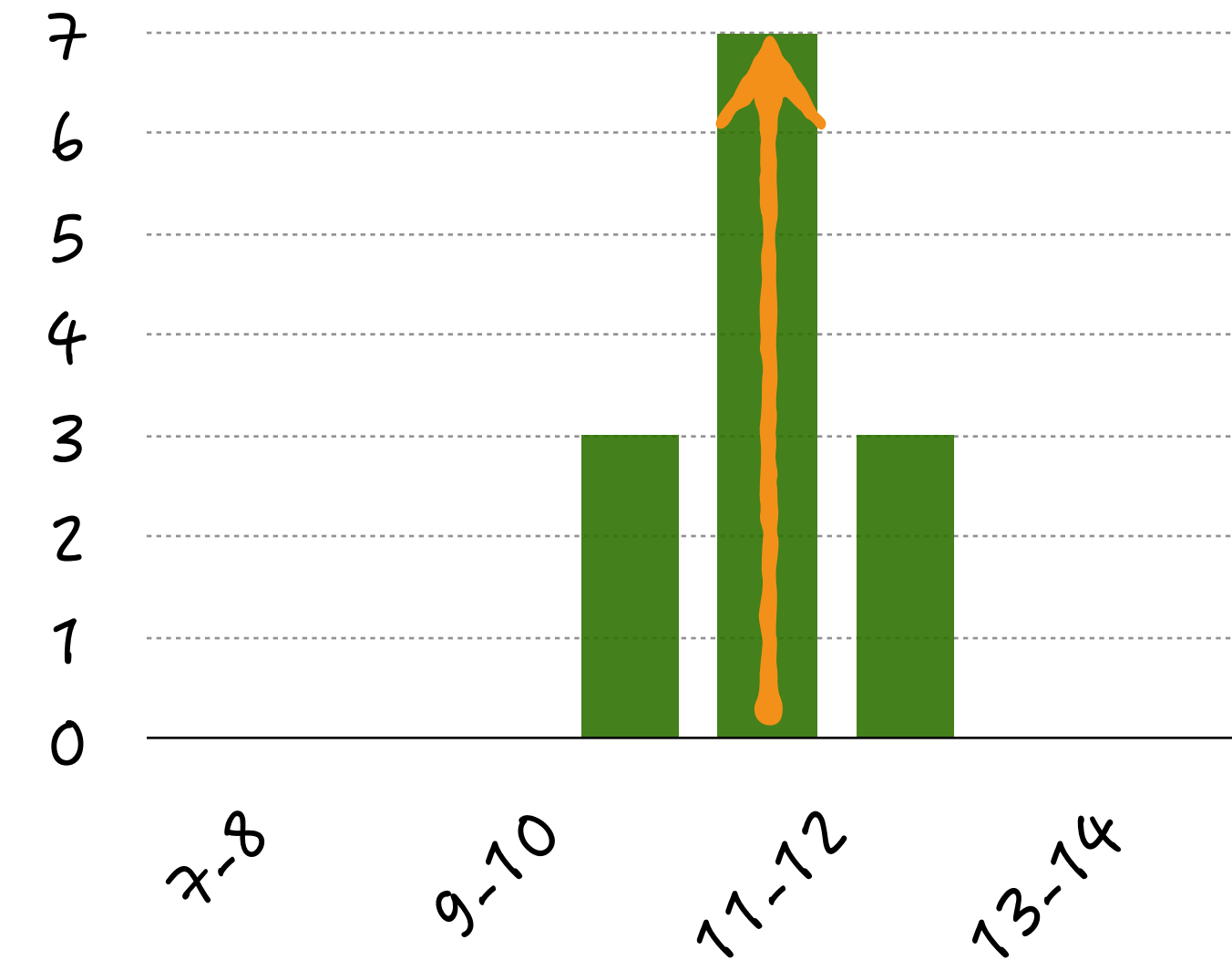
CONTENDER 2 :



CONTENDER 1 :

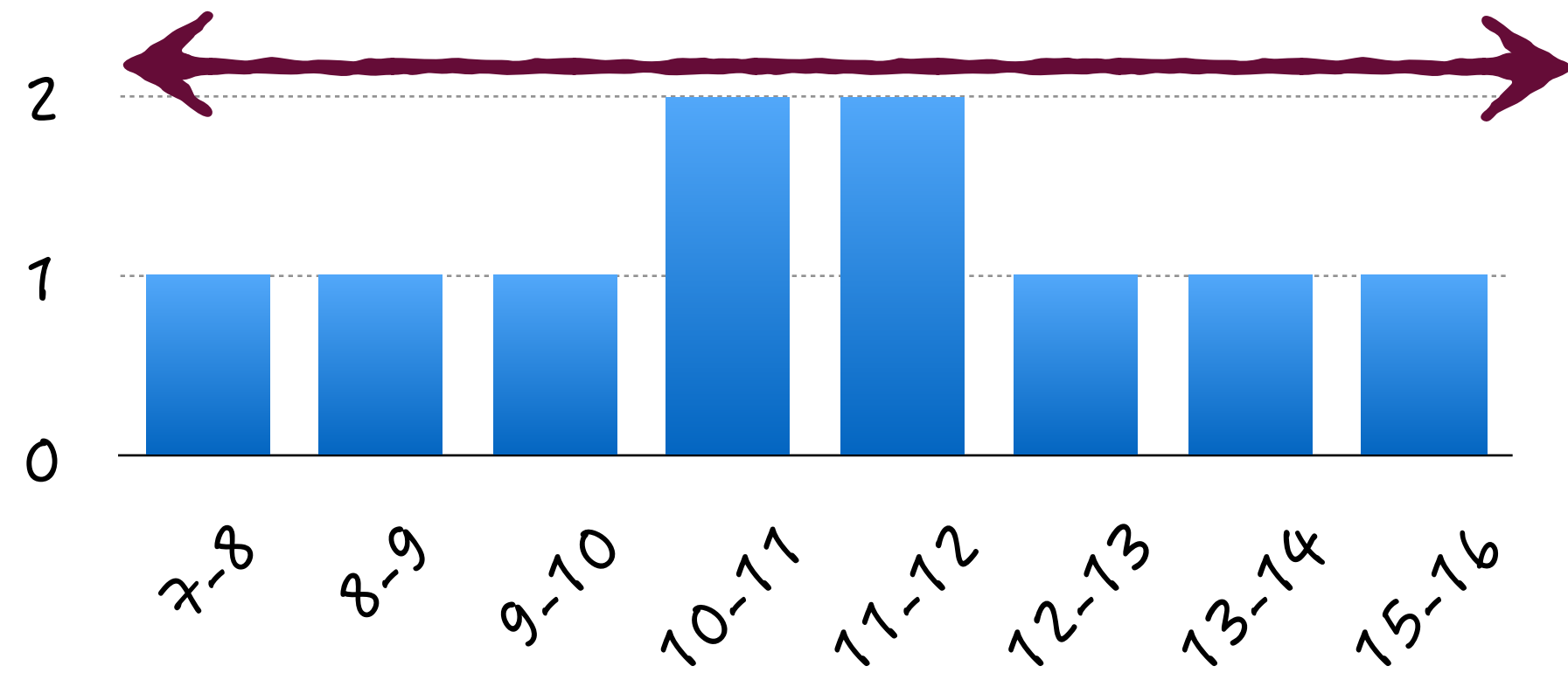


CONTENDER 2 :

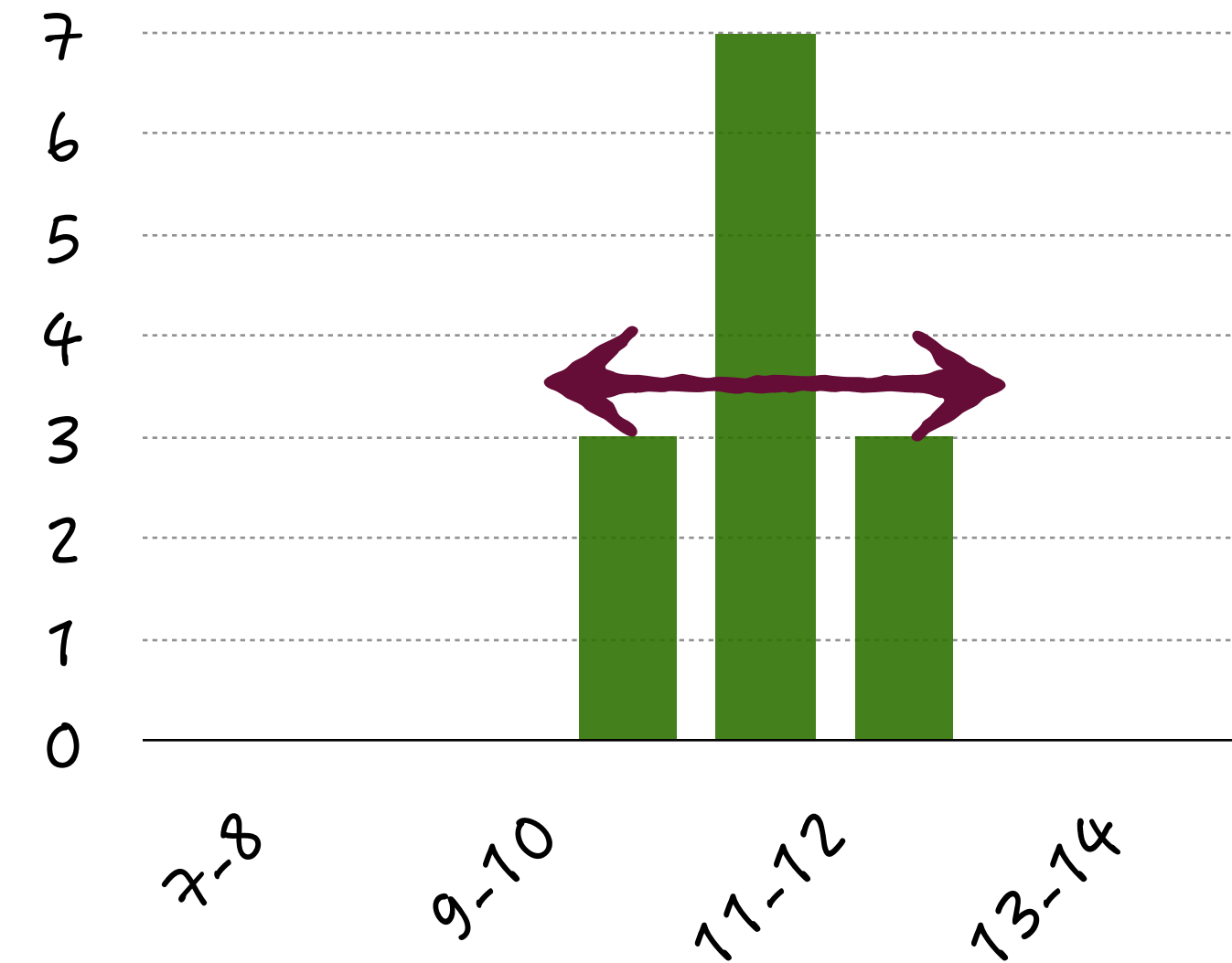


**BOTH OF THE DATASETS ARE CLUSTERED
AROUND THE SAME CENTRAL POINT**

CONTENDER 1 :



CONTENDER 2 :



**BUT CONTENDER 1'S DATA HAS
MORE "VARIATION"**

IN REAL LIFE, JUST AS IN THIS EXAMPLE

IT'S IMPORTANT TO UNDERSTAND
THE "SPREAD" OF A DATASET

NOT JUST THE
CENTRAL POINT

IT'S IMPORTANT TO UNDERSTAND THE "SPREAD" OF A DATASET

JUST AS THERE ARE MULTIPLE
WAYS TO FIND THE CENTRAL POINT

MEAN, MEDIAN, MODE

IT'S IMPORTANT TO UNDERSTAND THE "SPREAD" OF A DATASET
JUST AS THERE ARE MULTIPLE WAYS TO
FIND THE CENTRAL POINT
MEAN, MEDIAN, MODE

THE "SPREAD" CAN BE
UNDERSTOOD IN MULTIPLE WAYS

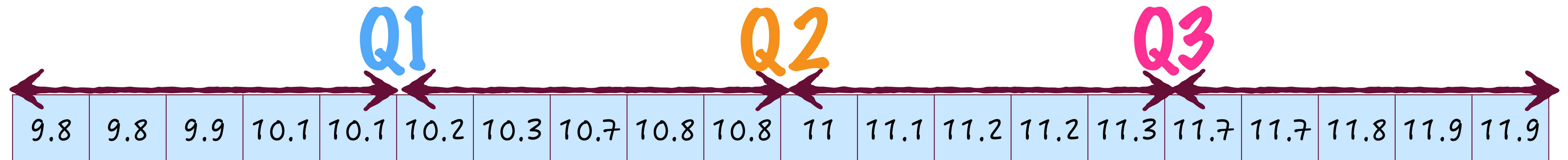
METHOD 1: IQR (INTERQUARTILE RANGE)

1. SORT THE DATA IN ASCENDING ORDER

9.8	9.8	9.9	10.1	10.1	10.2	10.3	10.7	10.8	10.8	11	11.1	11.2	11.2	11.3	11.7	11.7	11.8	11.9	11.9
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METHOD 1: IQR (INTERQUARTILE RANGE)

1. SORT THE DATA IN ASCENDING ORDER



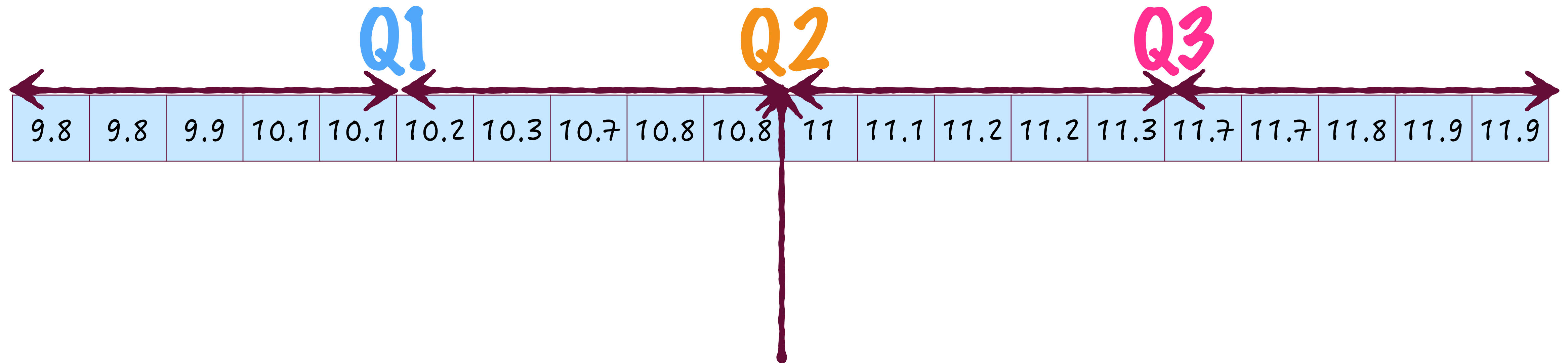
2. DIVIDE INTO 4 EQUAL PARTS

THE POINTS THAT DEFINE THE
PARTITIONS ARE CALLED

QUARTILES

METHOD 1: IQR (INTERQUARTILE RANGE)

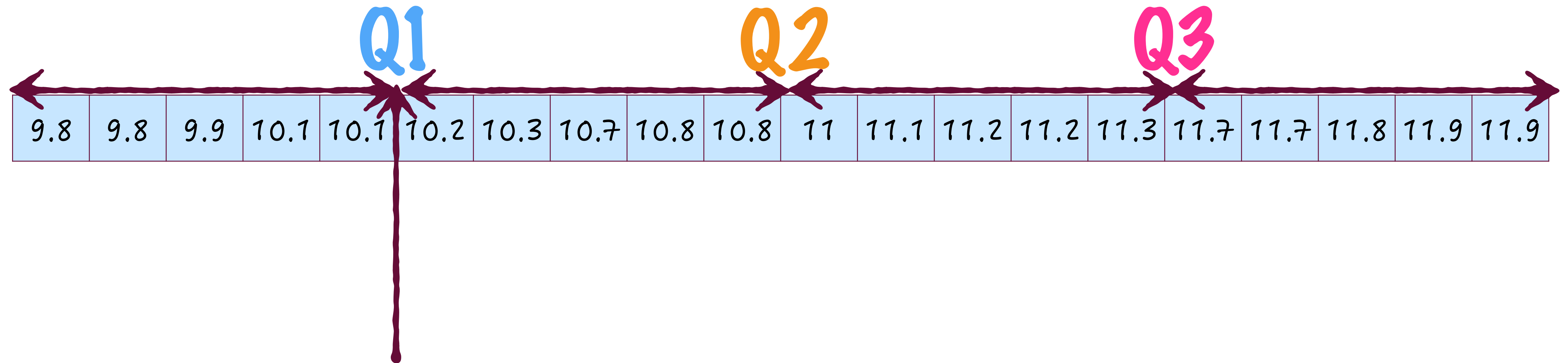
1. SORT THE DATA IN ASCENDING ORDER
2. DIVIDE INTO 4 EQUAL PARTS



THE SECOND QUARTILE IS
NOTHING BUT THE MEDIAN

METHOD 1: IQR (INTERQUARTILE RANGE)

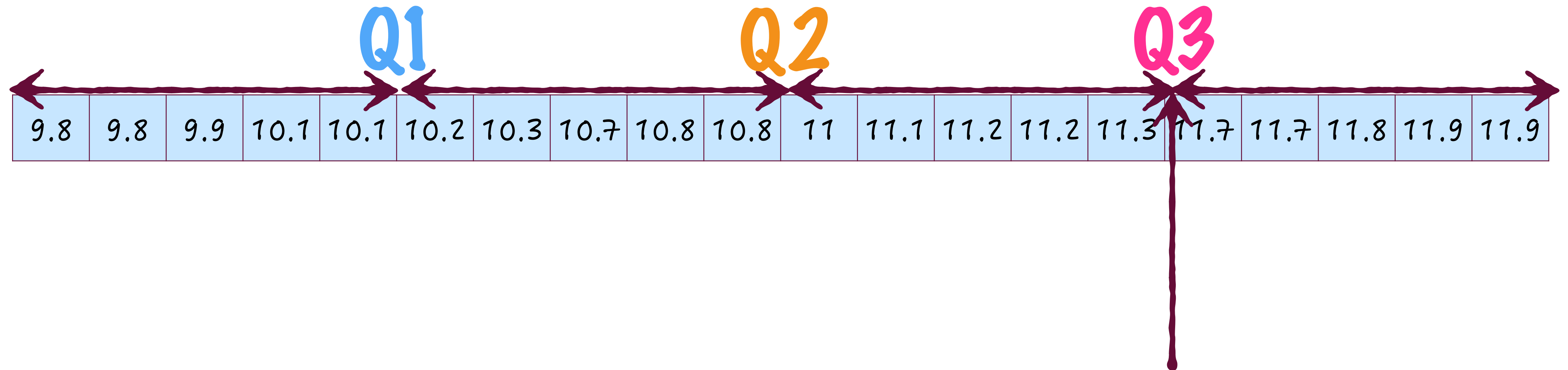
1. SORT THE DATA IN ASCENDING ORDER
2. DIVIDE INTO 4 EQUAL PARTS



THE **FIRST QUARTILE** IS THE
MEDIAN OF THE LOWER HALF

METHOD 1: IQR (INTERQUARTILE RANGE)

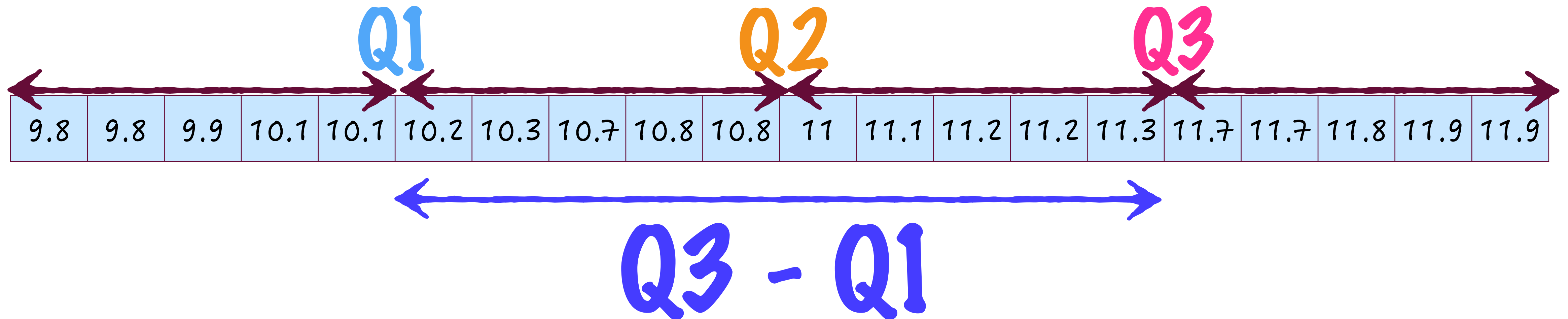
1. SORT THE DATA IN ASCENDING ORDER
2. DIVIDE INTO 4 EQUAL PARTS



THE **THIRD QUARTILE** IS THE
MEDIAN OF THE UPPER HALF

METHOD 1: IQR (INTERQUARTILE RANGE)

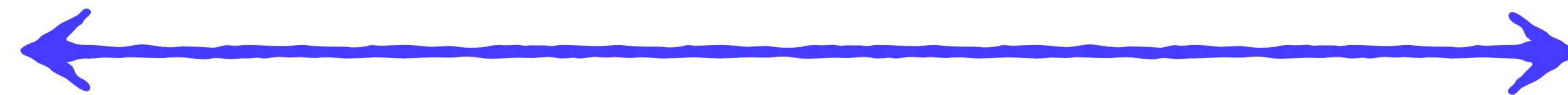
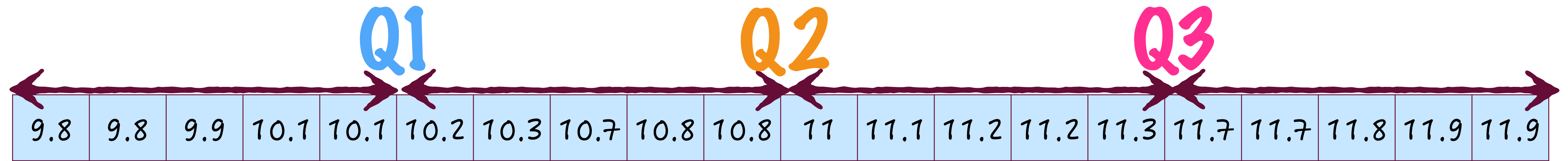
1. SORT THE DATA IN ASCENDING ORDER
2. DIVIDE INTO 4 EQUAL PARTS



**TELLS US SOMETHING ABOUT
HOW THE DATA IS SPREAD
AROUND THE MEDIAN**

METHOD 1: IQR (INTERQUARTILE RANGE)

1. SORT THE DATA IN ASCENDING ORDER
2. DIVIDE INTO 4 EQUAL PARTS



$$Q3 - Q1$$

INTER-QUARTILE
RANGE (IQR)

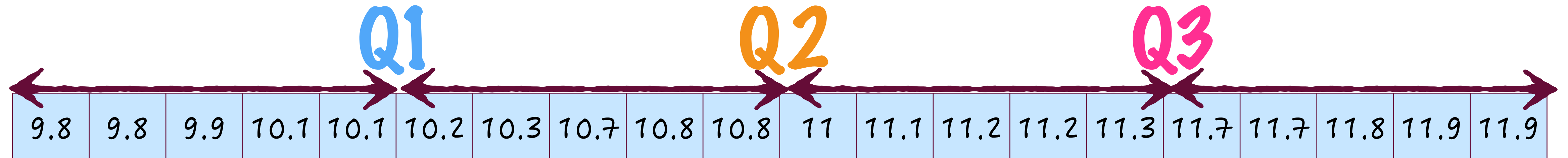
$$= 11.3 - 10.2$$
$$= 1.1$$

BOX AND WHISKER PLOTS

ARE A WAY TO
VISUALIZE THE IQR

$$\text{IQR} = Q3 - Q1$$

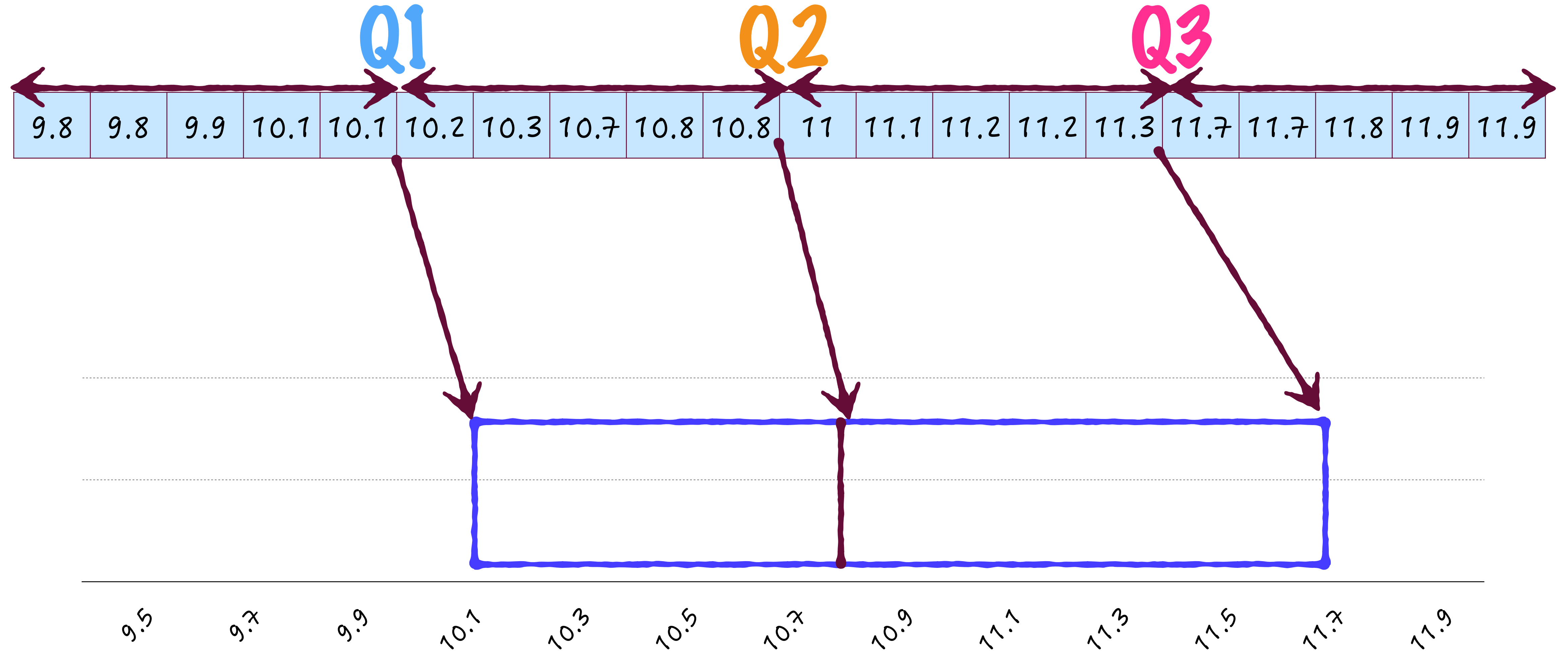
BOX AND WHISKER PLOTS



**FIRST A BOX IS DRAWN TO
REPRESENT THE 3 QUARTILES**

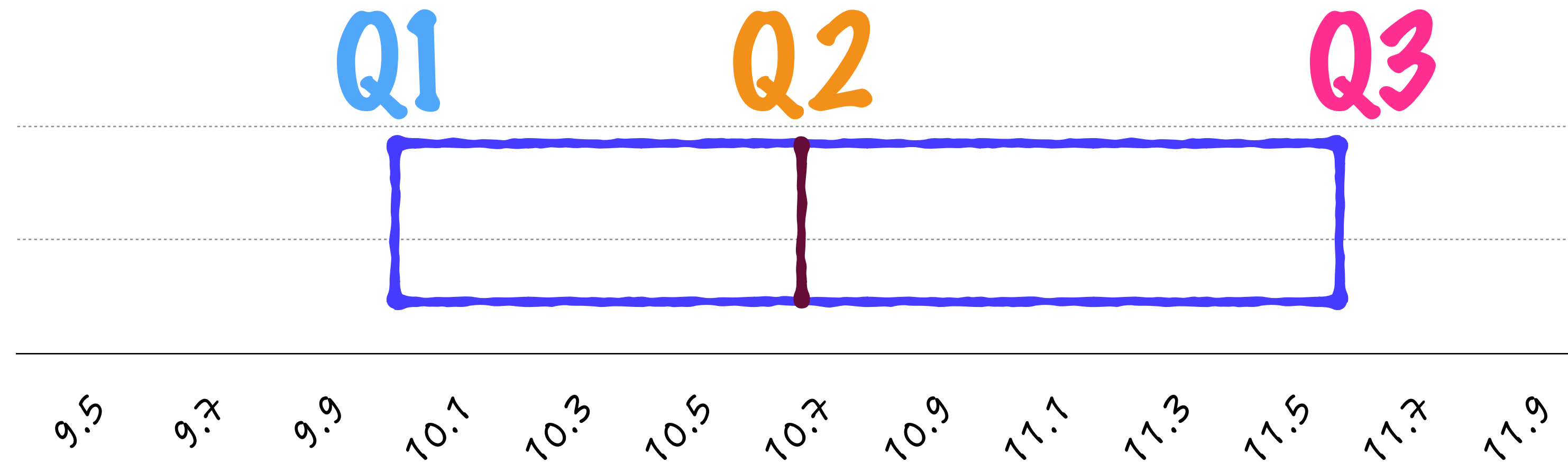
$$\text{IQR} = Q3 - Q1$$

BOX AND WHISKER PLOTS



$$\text{IQR} = Q3 - Q1$$

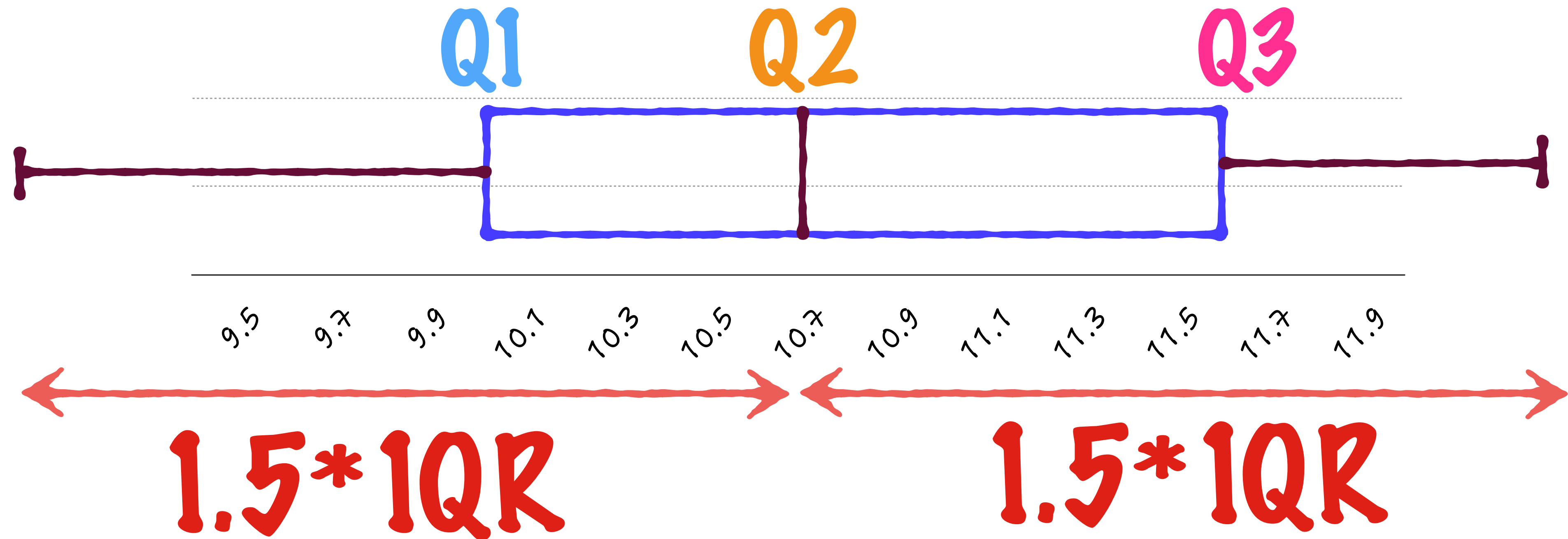
BOX AND WHISKER PLOTS



THEN **WHISKERS** ARE DRAWN
UP TO **$1.5 * \text{IQR}$** FROM THE **MEDIAN**

$$\text{IQR} = Q3 - Q1$$

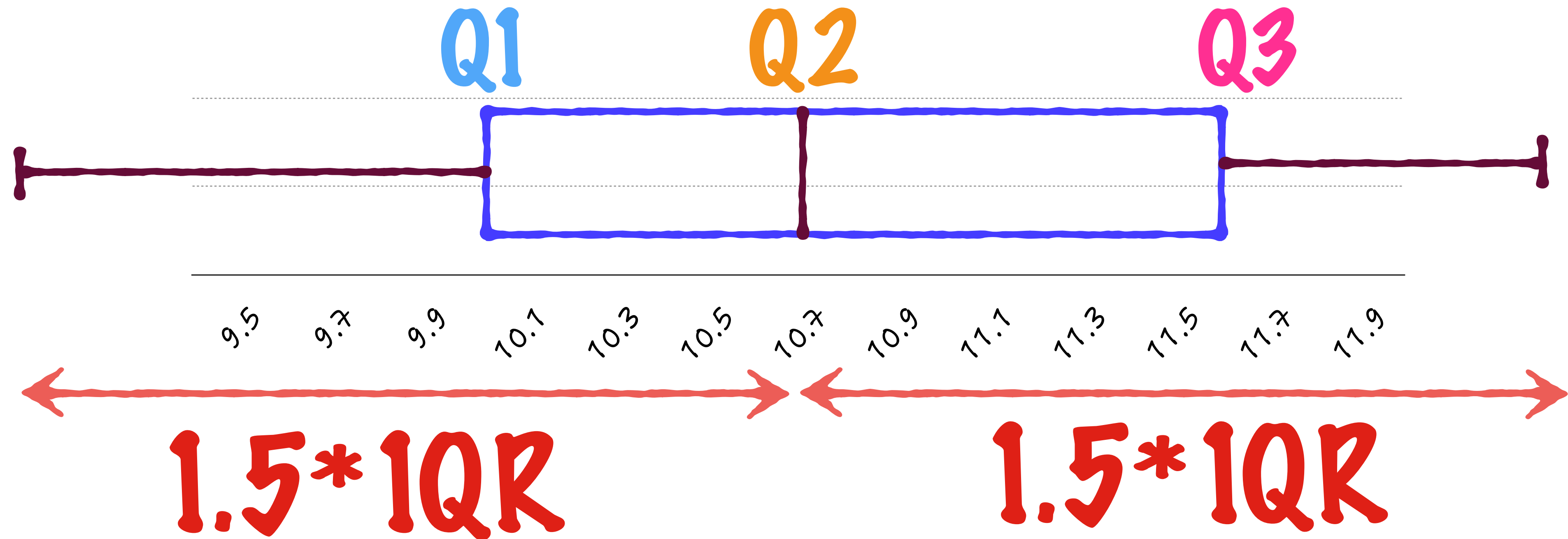
BOX AND WHISKER PLOTS



THESE PLOTS ARE VERY
USEFUL TO IDENTIFY OUTLIERS

$$\text{IQR} = Q3 - Q1$$

BOX AND WHISKER PLOTS



ANY POINTS THAT LIE BEYOND
THE WHISKERS ARE OUTLIERS