

# Growth of Dutch Children

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One understands by *secular growth* or *secular changes of growth* the changes in the development of children from one generation to another. In this task you use the data from the Dutch growth studies of 1997 and 1980 as well as the Coach program to study the changes in mean height for boys and girls in this period. We formulate the research question as follows:

## Research Question

What changes in mean height and in increase of height for Dutch boys and girls took place in the period 1980-1997?

Formulate and underpin your conclusions.

## Task 3. Secular Height Growth in 1980-1997

1. Start Coach and select the project *Growth of Dutch Boys and Girls*.
2. Select activity 3: *Secular Height Growth in 1980-1997*.
3. Carry out the tasks in this activity and answer the questions.

You need data to answer the above research question. Below are the growth data of the nation-wide Dutch growth studies of 1980 and 1997, respectively.

## Growth Data

Age is in years; height is in centimetres (and is of course a mean value).

Age	data 1980		data 1997	
	Height boys	Height girls	Height boys	Height girls
1	76.4	74.8	76.6	75.1
2	88.6	87.7	88.9	87.5
3	98.2	97.0	98.1	96.7
4	105.7	104.8	105.8	104.5
5	112.4	111.9	113.1	111.8
6	118.8	118.3	120.1	118.7
7	125.0	124.4	126.6	125.2
8	131.0	130.4	132.8	131.5
9	136.6	135.8	138.3	137.5
10	142.2	141.4	143.2	143.3
11	147.3	147.2	148.2	149.2
12	152.1	154.4	154.0	155.3
13	157.5	160.6	160.9	160.8
14	165.8	164.0	168.2	164.7
15	173.2	166.4	174.4	167.1
16	177.4	167.7	178.7	168.6
17	179.6	168.0	181.3	169.3
18	180.9	168.2	182.6	169.8
19	181.8	168.3	183.2	170.2
20	182.0	168.3	183.6	170.5

These data have been placed in a text window inside the Coach activity. The first task is to construct from this listing a Coach table with which you can really compute and that you can display as a data plot. The table window is already present to be filled. Hereafter you display the table as a diagram.

## Exercises

### *Filling the table*

- Place the growth data in the table that has been prepared already inside the Coach activity. Then, in the background, a table has also been filled exclusively for boys (See under the yellow button 'Display Table').

### *Boys height*

- Select diagram 5 that contains the graphs of mean height for boys in 1980 and 1997.
- Plot in the same diagram the difference between the heights; use a second vertical axis.

Because table and diagram may become full and messy rather soon, it is convenient to make several diagrams with the same growth data. In this way you can display various results at the same time, in a well-organised way, in separate windows.

Make a new table for boys:

- Press the yellow button 'Display Table'
- Choose 'New table'
- Give the table a name, say '6. Boys Height (copy)'
- Take for C1 Manual input: 'age'
- Put in C2 and C3 the data of the boys, according to the growth data of 1980 and 1997, respectively.
- Also add the height increases and the difference in height increase between these generations. Do not forget to enter the name, the quantity, and the unit.
- Make the 2<sup>nd</sup> and 3<sup>rd</sup> column with the height data invisible in the table.
- Display the table as a diagram. The diagram window contains the graphs of the height increase of 1980 and 1997, as well as the graph of the difference.

Answer the following three questions:

1. Up to what age is there hardly any difference in height and in height increase between the years 1980 and 1997?
2. What is the final difference in height and when has this value been reached already?
3. Use the increase diagrams to explain in plain words the differences in mean height growth for boys.

### *Girls height*

4. Redo the above exercises with the growth data of 1980 and 1997 for girls and answer the same questions.

### *Closure*

5. Do there exist differences in secular growth between boys and girls in the period 1980-1997? If so, what are these differences?