A VISIT TO THE

Computer & Communications
Museum of Ireland Limited

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"The Computer and Communications Museum of Ireland explores technology by preserving the past, demonstrating the present and educating for the future."

https://ccmireland.com/home/

Spreadsheet Age Calculation

Planning a school trip to the CCMI in Galway

Your homeroom teacher is planning to take her ICT class on a field trip to the CCMI, the Computer and Communications Museum of Ireland in Galway. The museum shows the history of computer technology in Ireland and more. The class will be given a guided tour of the museum and, as a special highlight, the class is divided into groups to explore the computers, machines and programs in workshops.

There are three workshops:

- Introduction to **Morse** *(ages 15 - 17)*
- Introduction to the **Basic** programming language *(ages 10 - 17)*
- 3D Printing using recycled plastic *(ages 10 - 17)*

Many of the students are between 13 and 15 years old. But to take part in the *Morse* workshop you need to be at least 15 years old.

Your homeroom teachers has a list of the names of the group and the dates of birth.

Help your group and make a list of all the students and how old they are going to be on the day of the trip to the museum in Galway.

Here is the task list.

TASK: Student list with age

Your homeroom teacher would like to have a **student list**, which not only contains the **names** of the students, but also their **age**.
The ICT teacher suggests that your class creates a spreadsheet with a spreadsheet application, which calculates the age by using the date of birth.

Requirements for your solution -
What your solution should contain:

Work effectively and create, as far as possible, the formulas so you can use them to copy and paste.

1. **Calculate** the **age** of all of your fellow students by using their date of birth and today's date, **without** using the two commands mentioned in Additional Task 2 , YEARFRAC (BRTEILJAHRE) or DATEDIF (DATEDIF).

2. Create a **data flow diagram** for this age calculation either by drawing per hand or using an application like Orinoco or else.

3. **Prepare a spreadsheet**, which is clearly laid out, which shows
   - name
   - date of birth and
   - the age of each of your classmates.

4. **Test your spreadsheet:**
   Add a students named Jane Doe and select her date of birth so that her 15th birthday would be
   - yesterday
   - today or
   - in two days.
   What stands out when the age is calculated? How are these solutions possible?

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ADDITIONAL TASKS:

Additional Task 1

✦ Set the format of all cells in the list, which contain an age information.

✦ In order to do this, set a custom (benutzerdefiniertes) format so that all the numbers in the cells have the label "years" following them.

Example:

Here you see an example for a custom format. The format was set to "meters". The data in the cells is displayed e.g. "3 meters", but internal only the number 3 is stored.

foreground	background (formular view)
Distance	**Distance**
3 meters	3
4 meters	4
5 meters	5
6 meters	6

Additional Task 2

✦ Use these two new functions to calculate the age by using the date of birth in different ways. Use your findings from task 4 and test your formulas again.

syntax	**DATEDIF(starting date;end date;unit)**
usage	Calculates the number of days, months, or **years** between two dates
	With the third argument, the unit (e.g. „Y") you say, if you want the solution in <u>whole</u> days (D), months (M) or years (Y). We would want to use years (Y).

syntax	**YEARFRAC(starting date;end date;basis)**
usage	YEARFRAC calculates the fraction (Bruchteil) of the year (e.g. 15,8 years) represented by the number of whole days between two dates (the start_date and the end_date).
	The basis sets how many days the years / months should have when calculating and if there is a leap year (Schaltjahr). If you do not put in a basis, the basis „0" is used.

Basis	Berechnung
0	12 months 30 days per month (US-method)
1	exact amount of days per month, exact amount of days per year
2	exact amount of days per month, each year has 360 days
3	exact amount of days per month, each year has 365 days
4	12 months, 30 days per month (European-method)

Guide Cards - *Copy, cut, and maybe laminate these cards. Put them on an extra table face down.*

**Detailed Guide for Task1
– How to calculate the age by using the date of birth**

The age is calculated by the <u>difference</u> (*"-"*) between <u>today's date</u> and the <u>date of birth</u>.

Then you get the number of days that the student lived up to today. This number has to be converted into years. *("How many days are in a year?" / "Days **divided by** 365 equals years.")*
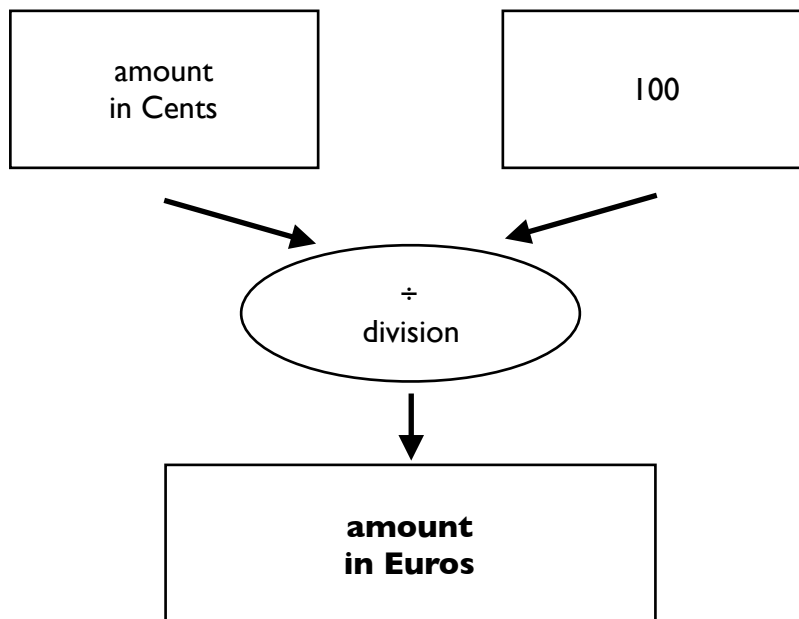
The result is a decimal number. Now this number needs to be rounded.

Then you have the amount of years the student has lived so far.

Guide Cards - *Copy, cut, and maybe laminate these cards. Put them on an extra table face down.*

Guide (low assistance) for Task 2.
– How to draw the data flow diagram per hand

Example:

Converting an amount of money in cents into an amount of money in Euros.

```
┌─────────────┐        ┌─────────────┐
│   amount    │        │     100     │
│  in Cents   │        │             │
└─────────────┘        └─────────────┘
        \                    /
         \                  /
          ↘                ↙
          ╭──────────────╮
          │      ÷       │
          │   division   │
          ╰──────────────╯
                 │
                 ↓
          ┌──────────────┐
          │   amount     │
          │   in Euros   │
          └──────────────┘
```

Guide Cards - *Copy, cut, and maybe laminate these cards. Put them on an extra table face down.*
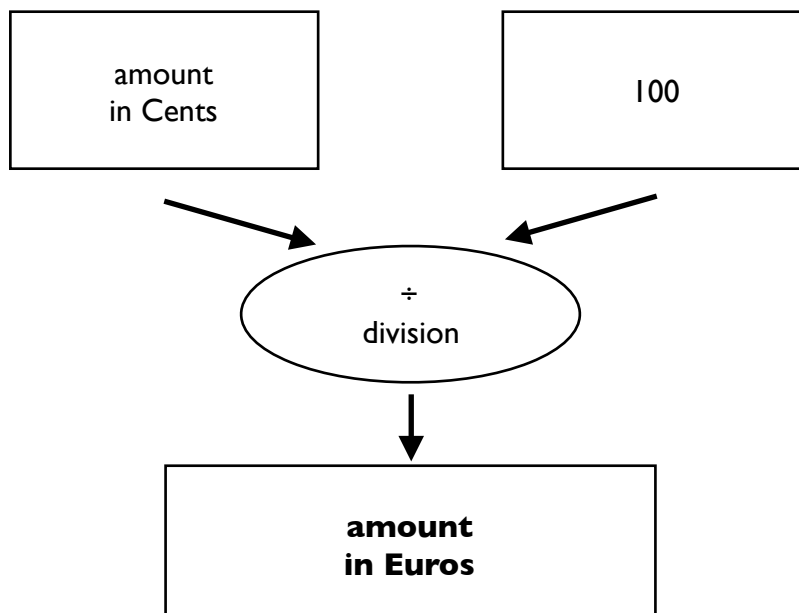
**Guide (low assistance) for Task 2.
– How to construct the data flow diagram with Orinoco**

Orinoco provides the main basic functions of a spreadsheet calculation program.

To show input of the date of birth and the conversion into a number in Orinoco, you need to use the function DATE (DATUM).

Hint

Spreadsheet programs automatically convert dates into numbers.

Guide Cards - *Copy, cut, and maybe laminate these cards. Put them on an extra table face down.*

Detailed Guide for Task 2.
– How to draw the data flow diagram using the application *Orinoco*

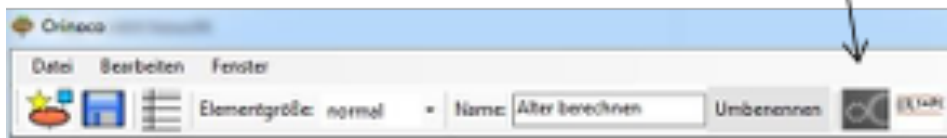To calculate the **age** these functions are useful:

- ROUND(value, amount_of_decimals)
  ABRUNDEN(Wert;Anzahl_der_Nachkommastellen)
  rounds the value to the number of decimals

- INT(value)
  GANZZAHL(Wert)
  converts the value into the next smaller number

- TODAY()
  HEUTE()
  gives today's date as a number

Guide Cards - *Copy, cut, and maybe laminate these cards. Put them on an extra table face down.*

Detailed Guide for Task 2.
– How to calculate the input values in the data flow diagram and show the data flow using the application *Orinoco*

- ■Click on the 'Gears-icon' ('Zahnrad-Button') in the top right corner.

- ■A window titled 'Calculate function' ('Funktion berechnen') opens.

- ■Insert the input values as individual numbers,
e.g. year of birth: 2003; month of birth: 9; day of birth: 22 for a date of birth on September 9th, 2003 (2003-09-22).

- ■In addition, click on the data flow ('Datenflüsse'), under 'visualisation' ('Visualisierung') within the 'output' ('Ausgaben') selection.
 By doing this all input values, intermediate values (dt. *Zwischenergebnisse*) and the output values are also shown as **number cards** within the data flow diagram.