

The school canteen & sandwiches



Name:

Class:



Utrecht University

Learning aims

These lessons are about sustainability. We work on the following learning aims.



For sustainability, you can:

- **recognise and map complexity**
- think of future scenarios
- **look from multiple perspectives**
- think of ways to intervene
- collectively come to decisions

Introduction

When constructing and fitting out a new school building, attention will undoubtedly be paid to reducing energy bills. This is not only a financial strategy, it also helps to reduce global CO₂ emissions!

By using (reusing) materials/constructions from the old school, raw materials can be saved. Also, the school can be designed so that used materials can easily be recovered and reused in 50 years, when the building will be demolished again.

And when talking about a future-proof sustainable school, we should also consider the building's users: is the working environment healthy and responsible? You can think about a healthy indoor environment, healthy and responsible food in the canteen, opportunities for exercise, a smoke-free school, inspiring outdoor space, etc.



In order to make responsible choices, you have to look beyond your nose: using tropical hardwood in the school may be very ‘sustainable’ (in the sense: something that lasts a long time) because you hardly need to maintain it, but tropical trees have to be felled for it. Who does that, under what conditions, how does tree felling affect local biodiversity, are there choices to be made here? Before you know it, you are bringing in the whole world...

Before making final choices, you will have to investigate what the consequences might be of decisions we make here for the new building. After all, these also affect **people**, the **environment** and the **economy** elsewhere (the **three Ps** of sustainability: people, planet, prosperity). And what may seem fine in the short term is a problem in the longer term. That way, you can see how **sustainable** our decisions are.

In this lesson series, we are going to attempt to take a closer look at what is on offer in the school canteen. Eventually, at the end of the series, you will make a recommendation about a new healthy and sustainable sandwich to the canteen staff.

In a group of 4 or 5 you will work on the theme of the **sustainable school canteen**.

Part 1 – 65 minutes

My school in the world

Before you start ‘mapping’ the topic, you will first need to become familiar with the ‘tools’ used to visualise complex issues. We do this through two exercises.

Exercise 1

- 1 Read the following text. Every group member takes five post-its and writes down a variable that is mentioned in the text on each post-it.

*A **variable** is something that can change in size (become less or more): for example, “the number of covid patients” but also “loneliness among the elderly”. “The virus” is not a variable, “the number of students infected with the virus at school” is. Do not use verbs but nouns!*

Corona

Somewhere in the world, there has been a first person infected with the coronavirus. The group of people carrying the coronavirus could expand because of transmission of the virus by infection. And the more infected people there were, the more infections were caused. The number of covid patients and associated deaths could thus grow explosively.

Especially when hospitals can no longer cope, deaths due to corona will increase additionally. Isolation/ quarantine of infected persons can reduce the chances of infection. The 1.5m measure, curfew and duty to wear face masks can also contribute to this.

This reduction in the number of infections can only succeed if people actually comply with the measures. This is far from easy because the measures have quite a few negative effects. Just think of the loneliness of elderly people, not being able to chill with your friends or not being able to organise fun outings and holidays anymore.

Recently, it appeared that the support for the measures is crumbling the longer it all takes. We have seen that in no time, this can bring about another wave of infection. In contrast, people who have been infected develop immunity and are less likely to infect others. Vaccination can also protect people from covid19 on the one hand and reduce the risk of infection on the other.

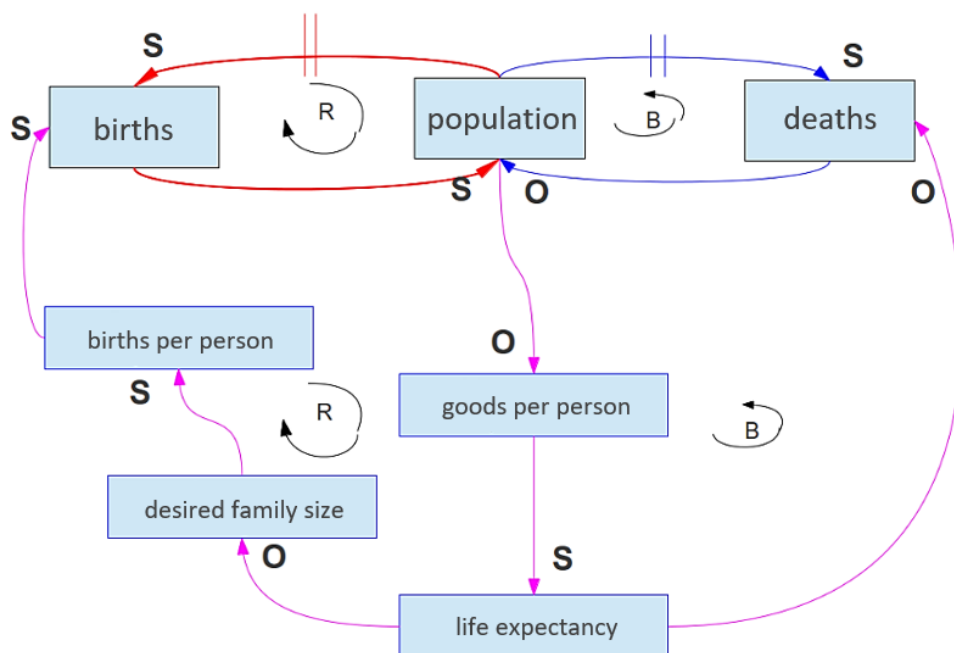
- 2** Share the variables that you wrote down on the post-its with each other. Decide on a **selection** of a maximum of 10 important variables.
- 3** Draw a circle with a marker on your poster. Stick the 10 post-its around the circle.
- 4** Check for **cause-effect relationships** between variables: to do this, find a variable that causes an increase or decrease in another variable on the circle (e.g.: the increase in the number of infections increases the number of hospital admissions).

Draw an arrow beginning at the cause and ending the arrowhead at the effect. Check whether you can also draw the arrow the other way round.

You eventually obtain a so-called **relationship circle**.

Exercise 2

- 5** Put a certain letter at each relationship arrow in your corona relationship circle. With the letter **S** at an arrow from variable A to variable B, you represent that when A increases B also increases and vice versa. S comes from the word **same**. With the letter **O** at an arrow from variable C to variable D you indicate that when C increases D decreases and vice versa. O comes from the word **opposite**. For example:



What you might have already noticed in the example diagram were the letters **R** and **B**. These are at the so-called **causal loops** (cause-effect loops) in the diagram.

The causal loop at the top left of the diagram shows that when the number of births increases the population also increases (S(ame)) and when the population increases the number of births increases again (S). Such a self-reinforcing feedback is given the letter **R** for **Reinforcing**. The causal loop in the upper right is of the B type: **B** means **Balancing** (= stabilising). To summarise:

S	<i>Same</i>	If A increases, B also increases	For arrows
O	<i>Opposite</i>	If A increases, B decreases	
R	<i>Reinforcing</i>	The variables keep increasing or decreasing	For loops
B	<i>Balancing</i>	The variables have a stabilising effect on each other	

6 Explain why the causal loop in the upper right corner is a **B**-type (it shows a stabilising effect).

7 In your own corona relationship circle, look for **at least 2 causal loops** (cause-effect loops) of both **R**-type and **B**-type. A causal loop exists if, by following arrows (in the arrow direction), you eventually arrive back at your starting variable. So the feedback can also run across multiple variables, as shown by the two other causal loops shown in the above example.

8 For these causal loops in your diagram, tell the story. For instance think about:

“The more ... there is, the less ...,
but therefore you end up with more ...”.

Main exercise: sustainable school canteen

Today, we will research the sustainability of one of the biggest classics of the school canteen is: **a sandwich**.

What about the **cheese**?

The **egg**?

The **tomato**?

And the **ham**?

The **lettuce or cucumber**?

And what about the **bread** itself?

What do we think about this sandwich? And how could we improve it?



Which ingredient have you received from your teacher? This will be the focus of your research!

Our ingredient is:

Unsurprisingly, things that seem sustainable at first glance end up not at all being so when you look a little further down the line. What may seem very positive from one perspective (rose-coloured glasses) may look much less pretty with other glasses on.

9 You are given a **short text** that is about the sustainability of your ingredient. Read it as you did in the corona situation exercise and again see what variables you can discover. These can serve as the start of your system about your ingredient.

You might need extra information besides the things you found in your text. You can look this up on your own.

10 Where is your ingredient produced? In your own country? In greenhouses, in stables? Or does it often come from abroad as well? And from where?

11 Explore sustainability aspects of your ingredient by looking at this product through different lenses/perspectives:

economic aspects (price, supply/demand, profit, (minimum) wages, consumption, etc.)

environmental/nature impact (water consumption, biodiversity, CO₂ emissions, etc.)

social aspects (health, working conditions, etc.).

You can use the websites your teacher has found for this, but also search for yourself!

12 (*individually*) Each group member again takes 5 post-its and writes a variable on each one which is **related closely or far away to your ingredient**. Use the information you found during the preparation task!

Again, think of the following categories so that you get a bit more variety in your variables (the **3 Ps!**):

variables that are mainly about **economic aspects** (price, supply/demand, profit, (minimum) wages, welfare, consumption, etc.)

variables that deal with the **impact on the environment and nature** (freshwater consumption, biodiversity, CO₂ emissions, etc.)

variables that deal with **social aspects** (health, poor working conditions, etc.)

13 (*together*) You are now going to build your system. Two variables have already been thought up for you (separate post-its) so you have a start to which you can build your system. Now, **one by one**, stick the relevant post-its (omit doubles you came up with!) in a logical way on your poster and **before you stick a new variable, draw the relationship arrows**. With each new post-it, check whether new relationship arrows need to be drawn. First stick a maximum of 15 post-its on the poster.

If you have another idea for a variable: write it down and stick it on the poster! (Remember exercise 1!)

14 Note down for each relationship arrow the letter **S** or the letter **O**. Do you remember?

S	<i>Same</i>	For arrows
O	<i>Opposite</i>	

- 15** In your own system diagram (poster), look for causal loops (cause-effect loops, as in Exercise 2!).

Make a real effort to introduce some causal loops into your own diagram, possibly with additional variables. Indicate whether the loops are **B**-type or **R**-type:

R	<i>Reinforcing</i>	For loops
B	<i>Balancing</i>	

- 16** Tell your story for a couple of the most important loops in your diagram. You can do this using a question such as: 'What if...?'

Researching opinions

In *Part 1*, you mapped out the issue about your ingredient. Hopefully, you did find causal loops in this system (e.g. **Balancing** and **Reinforcing** loops). Now you can use your system to see what options are available to make your new sandwich as sustainable as possible.

If you look closely at the system, you will see that the **R** loops are potential causes for the system being not sustainable. These loops only reinforce themselves, creating shortages (of water, for example) or surpluses (of unusable waste, for example). In other words, these loops stand in the way of **sustainability**!

17 Look at your system and look for causal loops. Can you find any R-loops related to your ingredient? About these loops, you can think about how they could be different: after all, they get in the way of sustainability.

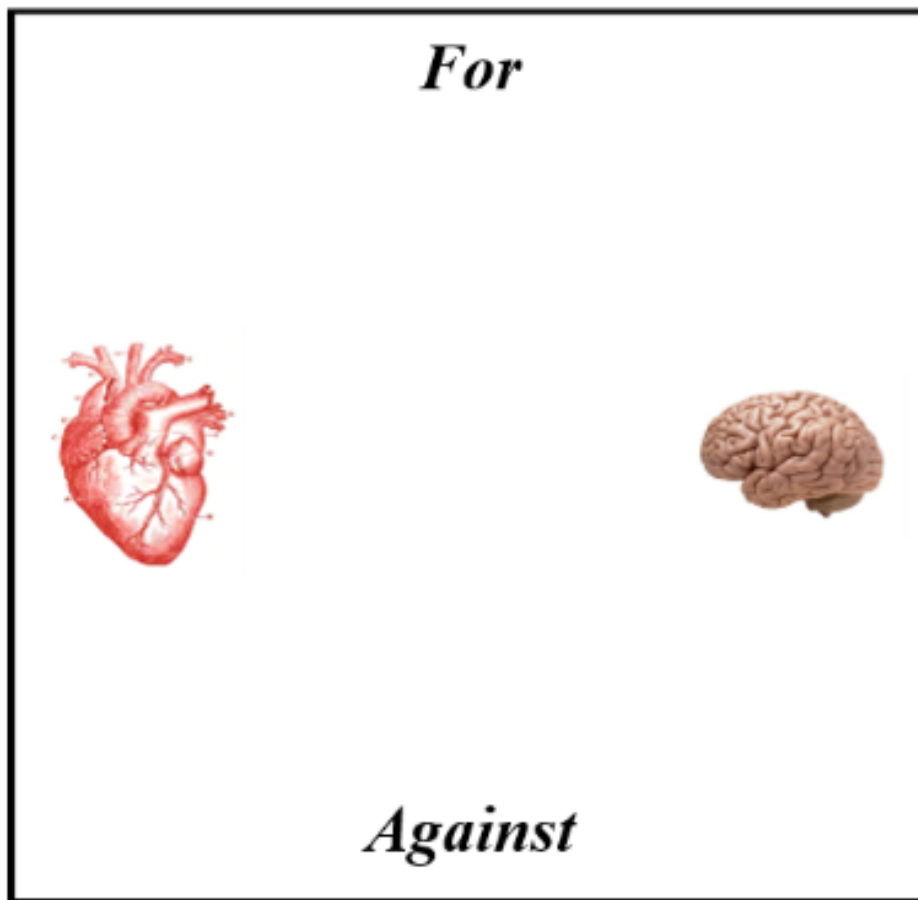
18 For one of the R loops (or, if you don't have one, for another loop you would like to change), come up with a **statement**. (For example, in the example about corona, this could be: 'All students should take a corona self-test at least twice every week').

When you have come up with a statement you hand it in to your teacher. You will need it for the next assignment: **arguments in motion**. Arguments in motion allows you to see what others in your class think about different statements. This is not about right and wrong, but about your personal opinions. You can be for or against the statement, and you may have reached this decision either by **thinking** (i.e. with your head) or by acting on your **feelings** (with your heart).

You use some of the self-devised statements for arguments in motion. Each time, the group briefly explains their statement in advance. What was the causal loop involving the statement? This way, you will learn about the other ingredients of the sandwich.

While doing arguments in motion, **pay close attention** to what happens in the class. This is because you can make use of the different opinions that come along when designing your new sandwich.

19 Write down below what you see happening during the arguments in motion activity. What opinions did your classmates have? What hadn't you thought of yourself? In the figure you can write down where someone stood in the class (i.e. whether this person was for or against and had decided with the heart or with the head). Use numbers for this. You can write underneath why these persons had stood there.



Sharing your advice

You are now ready to use everything you have learned to **design a new sandwich**. For this, you will of course use your mapped system from *Part 1*, but also the insights you gained during the arguments in motion activity from *Part 2*.

20 Make a decision with your group about which loop in the system you want to tackle. What really needs to be done to perhaps get the loop from *reinforcing* to *balancing*? Think about this:

- What should the sandwich **look like**? What's on it?
- What will be the **name** for your sandwich?

You get to pitch your sandwich to the rest in a moment, so be convincing and base it on what you have learnt this lesson! Maybe your sandwich will end up in the school canteen!

Evaluation and reflection

21 What have you learnt from this lesson series?

22 After this lesson series, I'm better able to judge whether something is sustainable or not

<i>Completely disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Completely agree</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Why?

23 Which part did you like most?

Why?

24 What would you change?

Why?

The end.

Student materials ‘The school canteen’

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