Handbook

Geo Circle

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Handbook for teachers, coordinators and managers

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1. Introduction Geo Circle

This Geo Circle Teacher Handbook is part of the Geo Circle project where students of 8 secondary schools in three European countries worked on several projects on circular economy. This book is background information for the teachers in the Geo Circle project. This handbook explains in detail how teachers can carry out a project in their school and gives lots of practical information and tips.

The methodology builds upon the successful Dutch 'IVN Junior Consultancy' method. The 'authenticity' of a project is always of paramount importance. Within the Geo Circle project, 'authenticity' means that young people will be able to work on a real assignment. A real assignment from a real client with the support from real experts will entice young people to explore society outside the realm of their familiar learning environment. As well as the students themselves, clients, specialised experts and other opinion makers are also playing a major role in these projects. The contents of the projects may vary, and in many cases the young, open-minded students come up with interesting and surprising results.

The Geo Circle projects builds a bridge between schools and companies and organizations in the real world. The Geo Circle project can be seen as a programme to connect the world of young people with modern society, where all partners learn from each other.

The Geo Circle project started in September 2017 and is funded by the European Union (Erasmus+ programme). The didactics for the Geo Water method were developed by IVN, the Dutch Institute for Nature Education and Sustainability. The Geo Circle project is a continuation of the successfull cooperation of these 8 schools in the Geo Water project (2015-2018), also funded by the Erasmus+ programme.

Geo Circle project partners

Coordination and didactics
IVN, the Dutch Institute of Nature Education and Sustainability – Groningen, Netherlands

Partner schools
Marne College – Bolsward, Netherlands
SZS (Zdravka) – Nymburk, Czech Republic
Städtiches Gymnasium – Haan, Germany
Visser 't Hooft Lyceum – Leiden, Netherlands
Gymnasium (GFP) – Neratovice, Czech Republic
Ohmoor Gymnasium – Hamburg, Germany
Het Baarnsch Lyceum – Baarn, Netherlands
Kreisgymnasium St Ursula – Haselünne, Germany

1. Introduction, a student consultancy on circular economy

1.1 Real assignments

The 'IVN Junior Consultancy' method connects education with society, and offers an experiental and meaningful way of learning on themes like water, energy, climate, spatial planning and sustainable development. The IVN method offers a strong infastructure for youth participation on policy.

A link between secondary education and society is realized through the concrete projects, cases, connections and activities of the IVN Junior Consultancy projects. The aim is to involve students in advising on various sustainability issues. The strength of these 'real' assignments lies in the fact that real clients (e.g. municipalities, institutions, companies) in the direct environment of young people are made visible and that students are taken seriously in their role as advisor.

This scenario is a guideline for the Geo Circle projects, the scenario written out in a general way. The output of the projects consists of a number of steps, consisting of episodes which in turn contain activities.

The project always starts with a training day for the participating teachers. The training is focussed on the didactics of 'Narrative design' (see section 3.2), but also on the ways in which the project can be carried out, taking into account the wishes of the school, and answers questions such as: How do you start the project? How do you ensure that students take this assignment seriously? How do they get the right knowledge? How do you get them excited to work as a real consultant?

1.2 How to start the project?

The students are asked to solve a real problem as Geo Circle consultants for a real client, with the aim of advising the client and the parties involved. But where do you start? And how? By means of various steps, consisting of episodes with activities. Using the 'Narrative design' didactics, a consultancy is formed by the students, from which they will work on their plans. The final product, consisting of advice in the form of a presentation, a poster and / or model, or any other supporting products to the client. This will be a motivation for the students to come up with good plans and advice. The consultancy will serve as a red thread throughout the entire process.

By carrying out the various activities in chronological order, the students and their consultancy firm always take new steps in the process to come to an advice. Depending on the assignment and the time allocated for the project, activities in the episodes may be skipped.

1.3 The process; overview of activities

Each project consists of three episodes; the start, elaboration and completion. Different activities fall within these three episodes. Depending on the assignment and the time allocated for the project, activities can be skipped. The exact time schedule is determined by the school and the executive teachers. The format below only gives an indication of the duration of a project in which all activities are carried out, varying from 14 to 33 lessons (hours):

Episode	Activity	Duration
Episode 1: Start	This episode is about exploring the assignment, setting up a consultancy and drawing up questions	2 – 9 hours
Episode 2: Realization	Answers are sought to the questions, by exploring and talking to experts, then final plans are made for the completion of the project.	6 – 15 hours
Episode 3: Rounding up	In the final phase of the project designs are made, a report is written, the presentation is prepared and ultimately the delivery and presentation of the advice	6 – 9 hours

During the Geo Circle projects, different skills will be discussed. For example, there is intensive collaboration during the project. To give structure to the planning and execution of the project, a work plan is created. By conducting research and having conversations, information is collected and processed for making the design. This design is ultimately presented to, among others, the client. Gradually the students come to different choices and they have to come to suitable solutions together

1.4 Presenting

The consultancy presents their work to the client, but also to other interested parties such as parents. For a good presentation, in addition to a good looking and carefully developed report with accompanying support resources, a PowerPoint or Prezi presentation has also been made.

Preparing a presentation does not have to mean a lot of extra work for the students. They are the real experts within their project. They are the only ones who are omniscient in their own plans and design. However, it is useful to discuss the structure of the presentation in advance, to divide the roles and to practice the presentation at school. The structure of the presentation is obtained by telling the story in chronological order. A wall frieze (a kind of bulletin board; see section 1.5) can play a supporting role here. The roles must be divided: who will present which part and are there roles for students who can support the presentation in a different way? Practice the presentation at school and give each other constructive, positive criticism.

See Activity 16 for more information about the final presentation and the tips that are important to think about when making it.

1.5 Practical tips

Rythm

Provide a good balance. This can be done by making sure students work in different workgroups throughout the project.

Structure makes space

Frameworks and structure enable personal input. So, do not say: draw a logo. But rather: draw your logo with your (coloured) pencils on this A4 sheet; you have … (minutes) to do this. If students cannot work with an assignment, it makes sense to wonder if the freedom for doing the assignment is perhaps too big.

Good work gives satisfaction

Insist that students deliver properly worked out assignments, so they can be proud fn their own work. You can make students work harder on their assignment by letting them present it to the other students, or by putting it up on the wall frieze.

Ensure quality

At the start of the project, make clear that a consultancy is too serious to be superficial in their work. Set substansive requirements on the work they deliver, and help them to improve the quality of their work.

Wall frieze

The wall frieze, which should be seen as a big bulletin board the size of a wall, is a suitable way to give students an overview on the story line. It is also possible to make use of a smart board. All intermediate products of the students will be put up on the wall frieze, in chronological order. They will stay up until after the project

Work meeting

This is a usefull tool to get an overview on the current state of affairs, to make sure everyone still has the same goal and schedule in mind. It is important to have a positive and constructive atmosphere during the work meetings.

2. Episodes and activities

The activities in this project are divided into three episodes: the start (1), the realization (2), and the completion (3). The activity sheet at the start of each episode will give you a short introduction about the goals and activities of that episode, together with some key questions which can be used during the activities to guide the students. More information about key questions can be found in section 3.8.

Above every activity in this manual, you will find three arrows whereof one is coloured. This shows to which episode the activity is connected.

1. Start   2.   3.

Like said before, it is possible to skip certain assignments and activities. It should be noted that activities with a star (★) are considered mandatory, and should not be skipped.

Episode 1: Start

During the start-up phase of the project, all students are introduced to the client and the assignment. Next, consultancies will be created, and the students will start to orientate on the questions which are derived from the assignment. At the end of this phase, all tasks will be divided among the students, where after they will start working on the project.

The following activities are a part in episode 1:

Activity 1	Introduction to the assignment ★	
Activity 2	Starting a consultancy ★	
Activity 3	Orientation on the problem	
Activity 4	Brainstorm session and generating questions	
Activity 5	Division of tasks	

Key questions

The questions below are examples of key questions which can be asked during the different activities.

Activity 1

- *What do we think about the clients' idea? Would it be interesting to look into this?*
- *What could be in it for us?*
- *How do we resolve objections that might come up?*

Activity 2

- *What could be tasks of a consultancy in our sector?*
- *What type of people would be working here?*
- *Answering the questions on the question cards 'starting a consultancy'*

Activity 3

- *What do we think when we hear the term 'sustainability'?*
- *Which aspects of sustainability could be important for us as a consultancy?*
- *Which elements in the given sources and videos are the most important when we look at our problem?*

Activity 4

- *What could be the main research question for our assignment?*
- *What would be the sub questions?*
- *Which methods would be used to answer the research- and sub questions?*

Activity 5

- *Which competences and skills are important for all employees of the consultancy?*
- *Which functions require a specific competence or skillset? Which competences and skills are these?*
- *In which way do your competences and statement relate to those of your co-workers?*

Activity 1: Introduction to the assignment ★

The client (or teacher) gives a short introduction in the assignment, during which he tells the students about the why and what, the process that students will walk through, and in what manner the results will be presented.

Form	Class
Duration	1 hour
Techniques	Reading comprehension + explanation
To do	- Start with an introduction (example below) - Read the assignment letter from the client together with the students - Give a short introduction on the subject and ask around for personal experiences - Talk about the process, from start till end
Materials needed	1. Introduction 2. Assignment letter from the client

Introduction

Dear students, as we have heard from our client, he/she is very interested in your ideas. He/she just gave you the assignment to think about a real problem. At the end of the project, the client wants to receive an advice from you in the form of a presentation and a report, together with any supportive tools like maps or scale models. The project up ahead is a big one, which will be tackled step by step as a group. Your final advices will be presented to parents and other interested people, but most importantly, to your client.

We will now read the clients letter together, after which I will give a short introduction in the subject and run through the different activities we will do to get to the best results.

Activity 2: Starting a consultancy ★

A client normally doesn't do business with students, but with consultancies. Students want their plans and advices to be taken seriously by the client. Therefore, they will create their own consultancy. This will be done following the question cards which can be found on the next page. The class will start their own consultancy with their own name, logo and mission.

Form	Class and in groups
Duration	1 - 2 hours
Techniques	Starting a consultancy following the question cards
To Do	- Divide the students in four groups. - **Option 1:** Give every group all the question cards (question cards with a ★ are mandatory) and let them carry out the exercises. This way multiple names, logo's missions, etc. will be made. - **Option 2:** Divide the question cards among the groups (question cards with a ★ are mandatory) and let them carry out the exercises. This way one name, one logo, one mission, etc. will be created. - At the end of the activity the students of the different groups will present to each other what they made and why they made it. - When **option 1** was chosen: Within the consultancy there will be a vote by all students (under supervision of the teacher): Which logo, which mission and which name are chosen? - When **option 2** was chosen: Under supervision of the teacher, the students together will decide how the results of the different groups will form the consultancy. - Dedicate an area on the wall (wall frieze) to the project. During the project, all products which are made by the students will be put on the wall, including their final products. - When the consultancy is established, a CEO and COO will be chosen.
Materials needed	1. The question cards which are on the next page 2. White and coloured paper, cardboard, glue, scissors, tape, stapler, pencils, wax crayons, felt tip pens

1. Start 2. 3.

Question cards: Starting a consultancy
Write, draw, describe, etc. your ideas. Use one sheet of paper for every
question card.

Name, logo and mission ★

- Think of a name for your consultancy
- Think of a logo for your consultancy
- Do you want your consultancy orientated on national- or international scale?
- Think of a mission, motto and vision for your consultancy to make clear to clients what you stand for.

Website consultancy★

- What would the homepage of your website look like?
- Do you want your consultancy to have a modern look, or a traditional look?
- What kind of buttons and shortcuts would your website have?
- How would you be able to instantly show your consultancies mission and vision?

Structure of the organization

In your consultancy, everyone is a consultant. However, there are a few tasks which can only be done by specialists.

- What would the organizational structure of your consultancy look like?
- Which kinds of specialists would be working at the consultancy?
- Do you co-operate with other businesses or specialists?
- Who brings in new clients?

Business card ★

Make a design for your business card

- What information should be on it?

Professions/Functions

Make a profile of multiple functions of the consultancy.

- What are the main occupations of this function?
- What skills or competences would you need to do this job?
- Which training or education would you need?
- What kind of courses would be useful for this function?
- Is this profession suitable for both men and women?

Successfully completed projects

- Your consultancy successfully completed several projects in the past year:
- Think of one or more projects which were completed
- Describe the client and the project
- Try to explain why your consultancy was able to be so successful during the project?
- What makes your consultancy the best one around?

Map of the office ★

- What would a map of the office look like?
- What makes the work you do visible inside the office?
- How many floors would the building have?
- What colour is the building?
- What makes the building sustainable?
- What does the surrounding of the office look like?

Activity 3: Orientation on the problem

The consultancy is starting up. The employees of the consultancy start thinking about how the project will be executed, and start reading into the questions of the client. What do the students already know about the subject? And what do they think about it? To stimulate every student to get closer to the problem, they will individually do the 'Future dreams' exercise. (see section 3.1).

The students will dive into the subject and research questions using a few sources with background information and videos they find on the internet. Let them make notes of the parts which they deem most important. IVN, the client and/or the teachers can prepare this activity and provide the videos and background materials for the students.

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Form	In small groups
Duration	1 hour
Techniques	In depth orientation
To do	- Carry out the individual exercise with the students - Divide the employees of the consultancy in small groups - The students will use the videos and sources to get closer to the problem and dive into the subject - Ask the students to write down the information which they deem most important
Materials needed	1. Explain the exercise 'Future dreams' (see section 3.1) 2. Background information and videos 3. Computers with internet access 4. Pen and paper

Activity 4: Brainstorm session and generating questions

Divide the students in small groups, and let them brainstorm to generate questions about the problem (see section 3.2 for more information). It is also possible to use the brainstorm technique from section 3.3 called 'Generate one hundred questions'

Let the students decide for themselves which questions need to be answered before they go to the client with their plan. During their first work meeting, the groups will report their findings. The result of the work meeting will be a research question and several sub questions which will be answered throughout the process. Let the students write down the subject and research question on a blue card, the sub questions on green cards, and the used methods on gray cards. The cards will be put up on the wall frieze, so everybody can see them.

Form	Class and in small groups
Duration	1 - 2 hours
Techniques	Brainstorming, 'Generate one hundred questions' and reporting
To do	- Explain the principles of brainstorming and the 'Generate one hundred questions' technique to the students - Divide the consultancy in small groups - Let the students brainstorm on the problem - Following the 'Generate one hundred questions' technique, let the students generate one hundred questions. - Let the students decide for themselves which questions need to be answered before they go to the client with their plan - Have a work meeting; Let the groups report on their findings, and let them determine their research question and sub questions - The research- and sub questions will be put up on the wall frieze together with the corresponding methods
Materials needed	1. Explaining brainstorming (see section 3.2) 2. Explaining 'Generate one hundred questions' (see section 3.3) 3. Blue, green and gray cards to write down the questions and methods 4. Pen and paper, pencils and felt tip pens
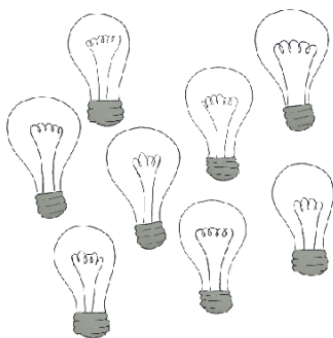
Activity 5: Division of tasks

Now it is clear for the consultancy which main question and sub questions are going to be answered, the tasks can be divided among the advisors. Different functions can be derived from the organizational structure which was drafted during activity 2. Every student will write a personal statement in which he/she will express their function preferences. They will also write down which connecting competences they already have or want to develop. The students will then present their personal statement, and compare their own competences to those of a few other employees.

The personal statement and competences can be used for personal guidance and talent development.

Form	Individually and in class
Duration	1 hour
Techniques	Dividing tasks using personal statements and competences
To do	- Every student will write a personal statement including the competences they wish to develop - The students present their statements - Tasks will be divided using the personal statement and competences - Put the task distribution up on the wall frieze - Make an overview of the competences which a student wishes to develop
Materials needed	1. Pen and paper

Episode 2: Realization

Now all preparational tasks have been completed, it is time for action. Every student is able to tell what the main question is and knows their tasks. The employees of the consultancy now need to deepen their knowledge on the subject ´Circular Economy´ using the activities of this episode. The results of the activities will guide the employees to shape their solutions and final plans.

Because all assignments in the Geo Circle project can have different topics and different clients, it is not possible to define specific activities here. We will use an example about a Geo Circle project focussing on energy. You can easily transform these questions to any other Geo Circle project.

The following activities are part of episode 2 (for an energy project):

Activity 6	A closer look at home – Investigation
Activity 7	A closer look at home – Results
Activity 8	A journey of discovery ★
Activity 9	Noting keywords and specify questions
Activity 10	Consult an expert + excursion ★
Activity 11	Mind mapping
Activity 12	Get the picture!
Activity 13	Final plans ★

Key questions

The questions below are examples of key questions which can be asked during the different activities

Activity 6

- *Where does energy come from? And how does it get to your house?*
- *To whom do we pay our energy bills?*
- *What measures can be taken to make a house more sustainable / save energy?*
- *Could an energy transition help solve our problem?*

Activity 7

- *Which sustainable or energy saving methods are being used in your homes?*
- *Which differences can you see between homes that DO use water- and energy saving methods compared to homes that DO NOT have water- and energy saving solutions? How can these differences be explained?*
- *Could the water- and energy saving methods used in homes also be used in our project?*

Activity 8

- *What is it that the client asks of us?*
- *What do we want to find out?*
- *How do we get this information?*
- *How can we divide tasks within out consultancy?*

Activity 9

- *What are our most important findings, ideas and insights until now?*
- *What keywords can be used to describe our findings?*

Activity 10

- *Which information are we missing in order to answer our main- and sub questions?*
- *What would we want to ask an expert?*
- *What kind of expert could we approach for our questions?*
- *What questions do we need to ask an expert in order to get the right answers?*
- *How do we make sure that present ourselves as a professional consultancy?*
- *If we want to go on an excursion, which location would be useful for us?*
- *What would we need to arrange to make sure our excursion is successful?*
- *Which way would be best to process our gained information?*

Activity 11

- *Which of the previously written down keywords are connected to each other?*
- *How could we all get the same idea by studying the mind map?*
- *Does the mind map create a collective idea for the project?*

Activity 12

- *How and where do we find pictures that accurately represent our keywords on the mind map?*
- *Is a collective idea created by the pictures which were chosen to represent the keywords and put on the mood board?*
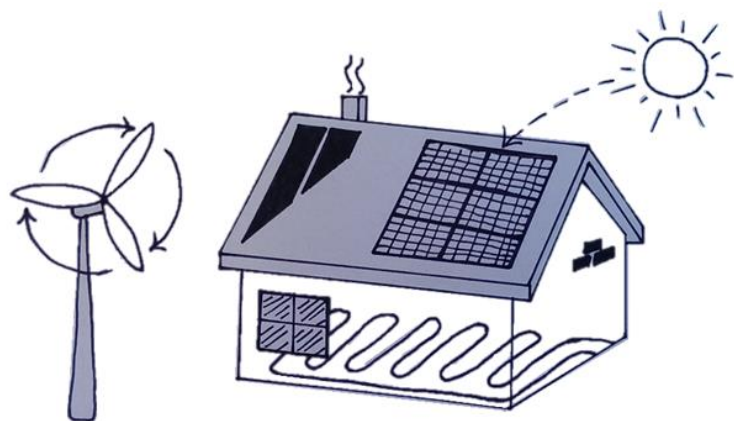
Activity 13

- *What would our collective vision be?*
- *Which ideas are definitively chosen to be in the final plan for the client?*
- *Do we all have the same vision for the definitive plans?*

Activity 6: A closer look at home - investigation

All students will take a look at the water- and energy usage at their own home. This will be done by monitoring the water- and energy usage for a period of two weeks. Together with the students, compile a usage scheme. All students will be using this scheme to make sure the results of all students are comparable. The students will write down the water, gas and electricity usage of their family every day, over a period of (at least) 2 weeks. Make sure they all start at the same day. They will also investigate if there are any water-, gas- or energy saving methods present. Which ones?

Form	Individual and in class
Duration	1 hour + the 'homework' spread out over two weeks
Techniques	Investigative learning
To do	- Have a class moment to talk about water- and energy usage. Where are the meters located? What do they look like? Who do we pay the bills to? How does energy and water get to our homes? Which sources can they come from? - With approval of their parents, let the students write down the readings of the water-, gas- and electricity meter, starting today. Let the students write down the readings every day, for two weeks. - Check the next day if every student wrote down the readings
Materials needed	1. Classical compiled usage scheme 2. Pen

Activity 7: A closer look at home – Results

The data which is collected by the students, will be discussed in class, under supervision of the teacher. Why do some houses use more energy than others? Which reasons can be found? They will talk about and discuss the data and different situations. Is it possible to conclude things from this investigation? Let the advisors compare their results, do any continuities show up? If yes, does that bring up ideas? Let them write down the ideas to use them as input for their own project. Also suggest that the kids talk to their parents/guardians about these ideas, to use them in their own homes.

|	
Form	In class
Duration	1 hour
Techniques	In class discussion
To do	- Discuss the results of the students. Are there any reasons for the differences? - Compare the results of the students. Is it possible to draw conclusions? - Let the students write down ideas to use it as input for their project - Suggest that these ideas can also be valuable tips for their parents/guardians when used in their own home.
Materials needed	1. Filled in usage schemes 2. Pen and paper

Activity 8: On a voyage of discovery ★

The employees of the consultancy will gather information in every way they can think of. Think of going on a field trip, interviewing experts of involved organizations, diving into the archives, looking up background information on the internet or in the library or by conducting a role play (see section 3.4), or any other way they can come up with to answer the main- and sub questions

When students are going to conduct an interview with an expert, or go on a field trip to a connected organization, make sure they are well prepared. This can be done by making sure they look up background information, and by using the tips for interviewing which can be found in section 3.5. During the preparation of an interview, guide the students towards asking open questions instead of closed ones. It is also important that every group member knows their role: who asks the questions? Who writes down the answers? Etc.

The students will work individually and in groups, resulting in work meetings and design sessions. The wall frieze will be filled with sketches, designs and draft versions of the reports.

Form	Individually and in groups
Duration	2 Hour
Techniques	(Field)investigations and work meetings
To do	- Guide the students in preparing and carrying out interviews, by giving them tips. - The students have a field trip to multiple locations - The students look up background information - Let the students do a role-playing game, to let them empathize with the different aspects of the problem. This role play should be conducted in the form of a discussion. - Interviews will be conducted, and the students will talk to experts from involved organizations. - Have work meetings and design sessions on basis of the results - Fill the wall frieze with sketches, designs, and draft versions
Materials needed	1. Computers with internet connection 2. Explanation role play (see section 3.4) 3. Tips on interviewing techniques (see section 3.5) 4. Pen and paper 5. White paper, coloured paper, cardboard, glue, scissors, tape, stapler, pencils, wasco
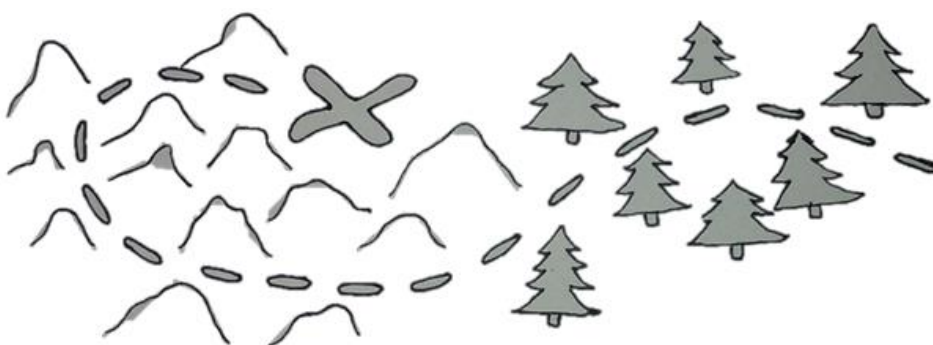
Activity 9: Write down key words and specify questions

After gathering information in groups, the consultancy will now sit together, to get to the core of the problem, and specify the ideas. These will be written down on A3 size paper in the form of key words. The subject of the project should be written down in the centre, with the key words around them. It is important that there is left some space in between the keywords. The students should use the whole sheet of paper.

Now that the students have processed the new information and newly acquired insights, it is time to sharpen the main- and sub questions in to their final versions.

Form	In class
Duration	1 – 2 Hours
Techniques	Writing down keywords and finalize questions
To do	- Let the students write down their most important findings in key words on a sheet of A3 sized paper. (Important: Use the whole sheet!) - Put up the A3 poster on the wall frieze - Sharpen the main- and sub questions to their final versions - Replace the older versions of the main- and sub questions on the wall frieze with the newly created ones
Materials needed	1. A3-poster, pencils and felt tip markers 2. Blue and green cards for the new versions of the main- and sub questions

Activity 10: Excursion and discussion with an expert ★

The employees conduct an in-depth discussion with an expert. For this discussion, an expert will be invited to the classroom, or the students will visit the expert on location. This conversation can take place when the employees have a lot of questions after deepening and/or the design is broadly clear, and they want to test this against the opinion of an expert.

The consultancy can also organize an excursion to visit a company or a location. The interview with the expert can possibly take place together with the excursion.

Form	In class
Duration	2 - 4 Hours
Technique	Writing down keywords and finalize questions
To do	- The employees decide together what kind of expert they would like to interview - The expert will be invited to visit the school, or the students will visit the expert on location - The employees conduct an in-depth discussion with an expert, using the tips on interviewing techniques (see section 3.4) - The results will be noted and put up on the wall frieze - The consultancy will organize an excursion - When possible, combine the excursion and the interview with the expert
Materials needed	1. Interview questions 2. Concept idea and / or design in broad lines 3. Pen and paper

Activity 11: Mind mapping

The consultancy has previously filled an A3 poster, with in the middle the subject of the research, and around it the concrete ideas in key words. The key words will be connected to the subject with coloured flowing lines and where possible with each other. When it becomes a messy whole, it might be better to rearrange the words. During the introduction, use the information about mind maps that is given in section 3.6.

Form	In class and in small groups
Duration	1 Hour
Technique	Mind mapping
To do	- The students will connect the previously written down key words with coloured flowing lines to the subject, and where possible with each other When it becomes a messy whole, it might be better to rearrange the words
Materials needed	1. Instruction about mind mapping (see section 3.6) 2. The A3 poster with key words 3. Pencils, wasco and felt tip points
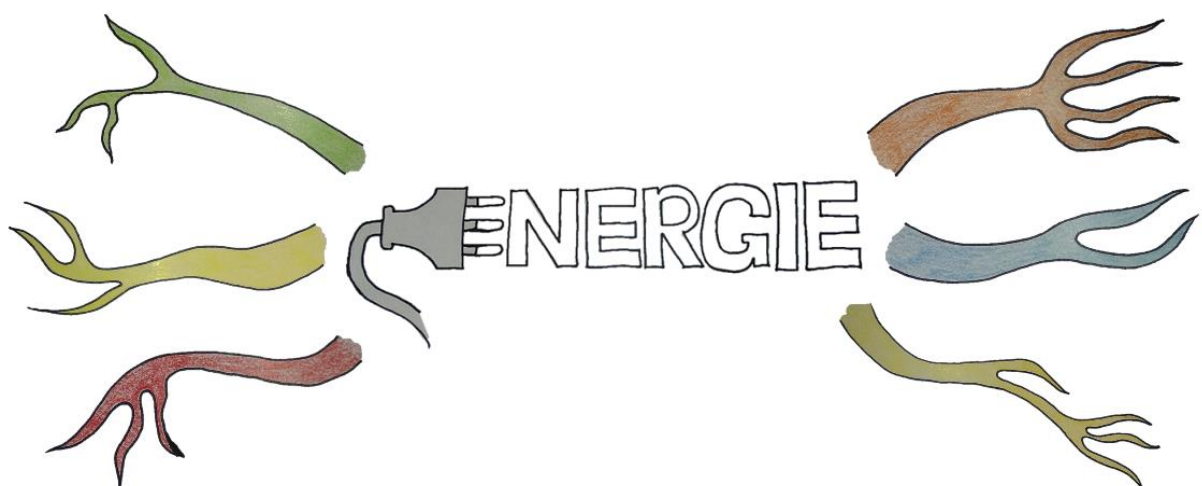
Activity 12: Get the picture!

To give the mind map even more colour, content, atmosphere and experience, the students search magazines and / or the internet for images; after all a picture is worth a thousand words. For every word on the mind map, the students search for five to seven matching pictures. The pictures are not yet to be stuck with the words.

When the five to seven pictures per word are collected, the consultancy determines democratically (most votes apply) which picture is linked to which word. This way, the whole group has the same idea and view regarding the design plans. The chosen images are pasted to the keywords: the mood board is born.

Form	In class
Duration	1 Hour
Technique	Mood board
To do	- The consultancy will search for images that strengthen the key words - For every keyword, the consultancy will search five to seven images - Do not stick the images to the key words yet - The consultancy will take a democratic vote to decide which image will be stuck to every keyword - The chosen images will be stuck to the key words - Give the mood board a nice spot on the wall frieze - All employees of the consultancy now have the same expectations and ideas about the design plans
Materials needed	1. A3-poster with key words 2. Magazines and the internet 3. Scissors 4. Chosen images 5. Glue and scotch tape

Activity 13: Final plans ★

The employees of the consultancy will brainstorm to determine which ideas they will process in the final solution of the client's problem. A joint vision is noted, considering the words on the mood board, and what they have discovered and experienced during the project.

Form	In class
Duration	1 hour
Technique	Work meeting
To do	- The students will have a work meeting to decide which ideas they will process in the final solution for the client. - Make note of the joint vision and put it up on the wall frieze
Materials needed	1. Mood board 2. Notes made during process 3. Pen and paper

Episode 3: Rounding up

In the final phase of the project, the consultancy will split up in several groups, where each group has its own final task. In this phase, a design will be made conform the wishes of the client. In addition, a press release, invitation and report are written, and a presentation is made and presented.

The following activities are part of episode 3:

> *Activity 14*   The design ★
> *Activity 15*   The presentation ★

Key questions

The following questions are examples of key questions that can be asked during the activities.

Activity 14

- *How could we get multiple good ideas for our design?*
- *Which way is the best way to work out our chosen designs?*
- *How can we make sure our design is of high quality?*
- *What materials are best suitable if we want to work out our designs?*
- *What would we write in the report for our client?*
- *What will our report look like?*

Activity 15

- *What kind of people would be in the audience during our presentation?*
- *In what manner do we invite people for our presentation*
- *What would we like to present, and in which order?*
- *How do we make our presentation interesting and fun to watch and listen to?*
- *How could we interest the press for our research, our presentation and our advisory report?*
- *What could we put in a press release?*
- *How do we contact the newspaper, radio, etc.?*
- *How do we ensure a professional attitude and image?*
- *What message would we want to give to the client?*

Activity 14: The design ★

The employees work out their solution of the problem in the format desired by the client, with possibly supporting designs such as a map, technical drawing or infographic. Section 3.7 contains information about making infographics, including an example of an infographic of an energy project. In addition to the design, a report is written, containing the advice to the client. It is extremely important that the designs are of very good quality, after all they are to be presented to the client. The mood board that was created earlier, can be used by the consultancy to guide them into the wanted atmosphere, for example the shapes and used materials.

Form	In small groups
Duration	4 - 6 hours
Technique	Designing

To do	- The chosen ideas are elaborated in different designs, in accordance with the wishes of the client
	- Supporting designs can be developed in addition to the main design
	- Let the students work out the plans in groups
	- Examples of designs and supporting materials (Designs with a ★ are mandatory):
	   o Report containing the advice ★
	   o Poster
	   o Scale model
	   o Map
	   o Infographics (see section 3.7)
	   o Folder
	   o Technical drawings
	   o Photos
	   o Videos
	   o Auditive means

Materials needed	1. Moodboard 2. Coloured paper, cardboard, poster sized sheets of (white) paper 3. Glue, scissors, scotch tape, stapler, etc. 4. Pencils, felt tip pens, wasco, fabric etc. 5. Computer (internet, Word, Excel, etc.)

Activity 15: Presentation ★

Now that the designs are finished, it's time to prepare and present the presentation. First, the consultancy writes a press release for internal and external publicity. For example, photos, texts or videos can be given a place on the school website for internal publicity. For external publicity you can think of local or regional news, which are often willing to publish news about a current social theme and post an article and / or photo about it. The chance of this will be much greater if a proper press release is sent from school.

Besides the press release, the consultancy will draw up an invitation, a PowerPoint or Prezi presentation and a good story for the presentation and the designs. It is also important to think about the decoration of the classroom and the clothing and appearance of the students who will present. On the next page there is a list of tips which are important to keep in mind when making a presentation.

Is everything complete and did the group rehearse the presentation? Then it's time to present to the client and hand over the report!

Form	In Class (the consultancy)
Duration	2 - 3 hours (preparation and performing)
Technique	Presenting
To do	- The consultancy works in groups on the various parts of the presentation - On the next page there is a list of tips which are important to keep in mind when making a presentation - A solid press release is drawn up (include at least one picture), which will be used for internal and external publication - An invitation is made for the client, parents, teachers and other interested parties - A PowerPoint or Prezi presentation is made with a well-constructed story - The presentation will be practiced at school (rehearsal). It is important to give the students tips after the presentation - If the class receives an invitation from the client to present their project on location, it is recommended to accept this invitation - The consultancy presents the final plan, and hands over the report to the client
Materials needed	1. Computer 2. PowerPoint or Prezi 3. Pen and paper 4. Designs which were made 5. Report for the client

Important steps for making a good presentation

The following tips are important to keep in mind when making a presentation

- Write down the core of the message in one or two sentences. What do you want to reach the public? What do they need to know? What should they see? What do they have to believe? What should they do?
- Consider what the target audience of your presentation will be. Do they already have inside information? Are they involved in the subject? Can they be biased?
- Think of a title for your presentation and chose the desired structure. Show the general starting situation, and show the process which the students have gone through to get to their final results. Conclude with the final designs and the corresponding conclusions.
- Make a speech schedule that shows who is presenting which item and in which order.
- Make the introduction and conclusion.
- Dress up the presentation. Provide drawings, scale models, folders, slides, photos, a PowerPoint or Prezi presentation, or other visual or auditory means
- Tell your story to the public. Try to make eye contact and speak clearly and intelligibly. Presenting can seem very scary. So, remember this if you stand before the big group: 'The audience knows nothing about the project. We know everything, because it is our design'. Holding on to that thought, you get more self-confidence and tell your story a bit easier
- Make a report of your advice for the client. Clients like it very much when they have a concrete product in their hands after the project, in which they can read the ideas, plans and recommendations.

3. Techniques and means

Within the episodes, multiple references are made to explanations about different techniques and means. The described techniques and means are added to support the students to get the most out of the project.

3.1 Future dreams

A good designer must be able to dream and empathize. If you want to stimulate the imagination of your students and really want to start dreaming about the possibilities, you can use the following exercise. The exercise can be adapted to the subject of the assignment.

In five minutes, give a short introduction about the short individual empathy exercise. Every student designer does the exercise for himself/herself. Students are allowed to write down ideas, but this is not required. Silence in the classroom is a requirement.

… Imagine, the year is 2040.
How old are you? What do you look like?
You still live in the same area, you like it, and wouldn't want anything else.
In what kind of house do you live?
What do you do in your spare time?
What do you see when you walk out the door?
What type of transportation do you use when you go out?
You are outside, enjoying your surroundings.
What changes are visible?
What has been significantly improved?
On the road you see ...

Using this exercise, the students will be pulled into the theme of the project.

3.2 Brainstorming

Brainstorming is a method to generate a lot of ideas in a short time. This can be done alone or with a group. Usually this method is used in groups, with the advantage that each other's creativity can be used. It is important that a brainstorm session is led by a session leader. If you, as a lecturer, fulfil this role of session leader, you have a good position to adjust and / or stimulate the process.

Phases
During a brainstorm session, multiple stages can be distinguished

Preparation phase	The session leader chooses a method, and provides a clear introduction and makes sure the issue is clear for all participants
Gathering phase	Many thoughts and ideas are conceived in this phase. Note: during this phase, quantity is of bigger importance than quality
Development phase	The ideas from the gathering phase are collected, sorted, and analysed for usability
Action plan	The action plan forms a concrete plan in which one or more innovative and useful ideas are developed and executed

Terms and conditions

Brainstorming sessions can be held in many ways. To achieve the maximum return from a brainstorming session, a few conditions must be met:

- Provide a relaxed atmosphere, openness within the group, privacy outside the group and extra (positive) attention for crazy ideas
- The subject of the brainstorm session must be clear to everyone, this way every participant will be thinking about the same subject
- A brainstorm requires clear guidance; all participants must be able to participate equally and be steered in the right direction through strong actions by the session leader
- In the gathering phase, the phase in which ideas are invented, the quantity is more important than the quality. By devising an abundance of varied ideas and viewing them from different perspectives, there may be some good ideas
- In the gathering phase, comments and ideas about ideas are strictly forbidden
- Criticism can counter spontaneous expressions of ideas. The good ideas will be separated from the less good ideas in the next phase
- Ensure cross-pollination: make sure that the ideas are collected and readable to everyone; going through the list of ideas can lead to new ideas!
- Remember that no idea is too crazy, in fact: crazy ideas can stimulate the creativity of others enormously!
- In the development phase, the bad ideas are separated from the good and the good ideas are tested for usability and innovation; discussion takes place to make clear which ideas are well applicable to the problem definition
- By making an action plan, it is clear to everyone what steps are needed to implement the ideas and who plays which role in it

Teaching methods

Ideas for teaching methods which can be used during a brainstorm session:

- Create 16 squares on an A4 paper (by folding or drawing lines) and have every student write down an idea in a box
- Call out ideas and have them written down. Cluster these ideas in the development phase. Clustering can be done by having a group discussion or by giving each group members three stickers which they can stick to the three ideas which are best in their eyes
- Use the brainstorming cards which can be found on the next page. Make a copy of the cards for every group, and let them decide for themselves which brainstorming method they want to use. Find on the next page which tickets are for which group, which choice there may be brainstorming method
- It is also possible to use the techniques called 'generating one hundred questions' (more information can be found in section 3.3) and 'Mind mapping' (more information can be found in section 3.6).

Brainstorming cards (TO BE TRANSLATED)

By accident

You are surrounded by all kinds of information and images, which can inspire you to create new solutions for your problems

- Formuleer het doel van de opdracht
- Kies *random* informatie: een foto, een voorwerp of zomaar een woord uit een tijdschrift
- Associeer rond de *random* informatie: welke woorden schieten je te binnen als je aan dit woord denkt, schrijf ze op
- Probeer met deze nieuwe woorden op nieuwe ideeën te komen voor je toekomstvisie, door verbindingen te leggen

The super hero

Helden brengen onze fantasie op gang; ze kunnen meer dan we zelf kunnen. Waarom hen niet vragen het probleem op te lossen?

- Formuleer het doel van de opdracht
- Neem een held of heldin in gedachten
- Breng de held of heldin tot leven: welke eigenschappen heeft hij/zij?
- Hoe zou de held of heldin jouw probleem aanpakken?
- Vertaal de ideeën naar concrete oplossingen voor het probleem

Similarities and differences

Patronen in je denken kun je omzeilen door nieuwe verbindingen te maken

- Formuleer het doel van de opdracht
- Kies een land of een dier
- Kies of je met de verschillen (A) of overeenkomsten (B) wil werken

Je werkt met de verschillen (A)
- Wat zijn de verschillen tussen het probleem en het gekozen dier of land? Schrijf de eigenschappen op
- Hanteer elke eigenschap als startpunt bij de zoektocht naar nieuwe ideeën

Je werkt met de overeenkomsten (B)
- Wat zijn de overeenkomsten tussen het probleem en het gekozen dier of land? Schrijf de eigenschappen op
- Hanteer elke eigenschap als startpunt bij de zoektocht naar nieuwe ideeën

Chronic ideas

Bewuste en onbewuste ingebakken ideeën houden nieuwe ideeën buiten denkbereik, daarom wil je die ingebakken ideeën achterhalen en doorbreken om, daar voorbij, nieuwe ideeën te ontdekken

- Formuleer het doel van de opdracht
- Vouw een A4tje vier keer dubbel en probeer in 5 minuten zoveel mogelijk vakjes te vullen met ideeën
- Schrijf de gemeenschappelijke kenmerken van deze eerste ideeën op en haal zo de ingebakken ideeën eruit
- Vraag je bij ieder ingebakken idee af; 'wat als' je dit ingebakken idee elimineert of omkeert?
- Gebruik dit als startpunt om nieuwe ideeën te ontdekken

3.3 Generate one hundred questions

If you want to increase the curiosity and involvement of the students regarding the subject of the problem, this technique works wonders. Students come up with many questions with this technique, after which they start research themselves. In one way or another, pupils want to have their own questions answered. Try to activate the students a little: "We do not really know much about this issue, but can we think of questions about it? Can we think of 25? Or 50? Or could we even think of 100?" The students will be divided in small groups, and think of as many questions as possible. They write every question clearly legible on a separate post-it. Then the questions are divided into categories; you can think of categories yourself or let the students do it. Each category is written on a large piece of paper, after which the students stick their questions in the correct section. Duplicate questions are stuck on top of each other. You can also add questions yourself.

It is quite possible that there are too few questions in certain categories or that categories are missing altogether. Ask the students to think of specific questions for these categories.

Discuss the questions and mark the questions the students deem most important. Of course, you can mark some questions as important yourself to guide the students.

If the collection of questions is only meant to reflect on the content and scope of the problem, you can stop here. If the questions are meant for the start of a project, you will also decide which questions are going to be answered by which students. Let them report their findings to each other in order to work out the information.

3.4 Role play: empathize with interests

A discussion about a topic can become even more interesting, when you are not expressing your own / your groups opinion, but by empathizing with the interests of others. A role play is a suitable technique for collecting opinions and facts and exploring the scope of the subject. Let the students empathize with different groups of interest. The table below is an example of different interest groups for a project on sustainable energy:

Sustainable energy	
- Director of an energy company - Installer of solar panels - Housing association (district manager)	- Employee nature and environmental organization - Municipality (environmental inspector) - Customer (buyer of a product)

In a class discussion create a representative of every sector / interest group. Do this using the following questions:

- What kind of person could represent the interests of the sector well?
- Is it a man or a woman?
- How old is this person?
- How will we call this person?
- What kind of work does this person do?

Write down the decisions taken by the class about the different representatives. Then let the students form groups around the various representatives, or make these groups yourself. Optionally, the groups can give a more detailed description of the person in question beforehand. Then put each group to work with the following questions:

- What do you think this person thinks of the sustainable energy plans?
- What benefits can he / she get of these plans?

- • What disadvantages can he / she get of these plans?
- • What arguments does this person have?
- • What other interest groups will think the same as us?
- • Which people or interest groups have a different opinion than we do?
- • What arguments would those people have?
- • What is our opinion on those groups?

Have the students write down their points of view, and their arguments. To kickstart the role play, role-play cards with possible arguments are included on the next page. The arguments are 'double': sometimes in favour of sustainable energy, sometimes against. It is up to the students which cards they choose when performing the role play. Please note that there shouldn't be a sudden change from pro to con, because this is not very realistic. Of course, the pupils may bring their own arguments into the discussion.

After the creation of arguments, have them make a clear nameplate for their person. Ask the groups who will be the spokesperson of the group, then conduct a discussion meeting as described below.

Discussion meeting

Make a nice meeting set-up in the classroom, with a semi-circular arrangement of chairs and tables in the middle. The spokespersons of the discussion will sit here. Behind every spokesperson is the group that has prepared the discussion together with the spokesman. These pupils can help, whisper, pass notes or indent if the spokesman doesn't know how to answer a question. As a teacher you lead the discussion. Make sure before the discussion starts, that the purpose of the discussion is clear, and that the atmosphere is positive and constructive.

Each spokesperson briefly introduces himself: who he/she is and what is his / her opinion about the subject in question. The discussion leader once again clearly explains the question about the discussion. Then each spokesperson gets one minute to explain their own position: 'I think ... because ...'. After each spokesperson explained their point of view, a question round follows. Spokespeople may ask each other questions, but make sure that the answers remain short. A second question round follows, in which the audience may ask questions to the spokespersons. Questions are put forward when answering the questions. Each spokesperson gets half a minute to clarify and defend their own position.

The discussion leader must ensure that all statements are addressed and that everyone has the opportunity to speak. Note that new arguments should constantly be added, repeating the same facts and opinions adds nothing interesting to the discussion. When opinions are given, they must always be supported with arguments. The discussion cannot last indefinitely and must be stopped at a given moment. When the time is almost up, you must warn the students. This way the discussion can be guided towards the end. At the end of the discussion the most important points are briefly summarized.

It is important to take the feelings of others into account! Even if someone thinks that they are right. Nobody is going to make another person look ridiculous.

Role play cards: get familiar with certain interests (TO BE TRANSLATED)

These six role play cards give examples of arguments pro and contra of various stakeholders in a project about sustainable energy.

Director of a energy company

Voor
- Het aanbieden van duurzame energie is een plicht voor iedere ondernemer: we hebben de aarde immers niet geërfd van onze ouders, maar te leen van onze kinderen
- Als ons bedrijf in de toekomst nog wil blijven bestaan, zullen we zuinig met energie en grondstoffen moeten omgaan en mee moeten gaan met de tijd
- Het aanbieden van duurzame energie biedt ons goede kansen om ons te onderscheiden van onze concurrenten

Tegen
- Om goed geld te kunnen verdienen, zijn investeringen in duurzame energie niet erg slim: het duurt veel te lang om die investeringen terug te verdienen
- Het zal mijn tijd wel duren… Wie dan leeft, wie dan zorgt
- Al die regels… we hoeven toch niet altijd het braafste jongetje van de klas te zijn? In Nederland lopen we al voorop, laat eerst andere landen maar investeren

Assembler of solar panels

Voor
- Op technisch gebied ligt er een enorme uitdaging te wachten om duurzame energie te produceren: kom maar op, de zon schijnt toch niet voor niks?!
- De wind, de zon; het kan worden gezien als gratis energie waar we allemaal gebruik van moeten gaan maken, zodat we niet meer afhankelijk zijn van een grondstof die op raakt
- Door het gebruik van duurzame energie zorgen we samen voor een CO_2-reductie

Tegen
- Ik zie er enorm tegenop de werkvloer hierin mee te krijgen; mensen zijn gewoontedieren en houden niet van verandering
- Al die technieken zijn nog erg nieuw en hebben allerlei kinderziektes, laten we nou eerst maar eens afwachten tot ze hun waarde hebben bewezen en daarna kunnen wij ze misschien wel invoeren; hoe zit het bijvoorbeeld met de terugverdientijd?
- De ontwikkeling van nieuwe technieken gaat zo snel, het is alweer verouderd wanneer je het onder de knie hebt

Housing association (district manager)

Voor
- Ik ben blij met een werkgever die bewuste keuzes maakt; het gebruik van duurzame energie is ook nauw verweven met onze arbeidsvoorwaarden
- Ik vind het fijn om tegen mijn kinderen en buren te kunnen vertellen dat ik niet bij een 'vieze vereniging' werk, maar dat we aandacht hebben voor duurzame energie: dat maakt me trots
- Ik merk dat al die aandacht voor klimaat en energie me bewuster maakt, ook thuis, en dat is alleen al goed voor de portemonnee

Tegen
- Bij de directie verzinnen ze mooi van alles achter hun bureau en wij moeten het werk doen: niet alle klanten zijn blij met deze veranderingen en dat krijgen wij dan weer te horen
- De werkdruk neemt door al die veranderingen af en daardoor zijn er minder mensen nodig; ik wil door deze veranderingen mijn baan niet kwijtraken

Employee of a nature/environmental organization

Voor
- We hebben een gezamenlijke verantwoordelijkheid voor de toekomst van onze planeet, dat geldt voor overheden, burgers en bedrijven
- Groen is goedkoper: met enkele aanpassingen of investeringen is gebruikmaken van duurzame energie mogelijk; de balans slaat bijna altijd positief uit
- Groen is positief: een steeds grotere groep consumenten houdt rekening met de klimaatimpact van hun inkopen: het gebruik van duurzame energie draagt bij aan een positief imago
- Het wordt hoog tijd dat er belasting wordt geheven op CO_2-uitstoot en ook een extra milieutax op energiegebruik: immers, de vervuiler betaalt!

Tegen
- Mensen verwachten iets, maar we kunnen deze verwachting niet altijd waarmaken doordat we ook afhankelijke zijn van andere partijen

Municipality (environmental inspector)
Voor
- Als gemeente moeten we sowieso het goede voorbeeld geven, anders zijn we behoorlijk ongeloofwaardig: ik doen mijn bedrijfsbezoeken dan ook niet voor niets in mijn dienstauto op aardgas
- Het klimaatprobleem is van ons allemaal, we zullen er dus samen de schouders onder moeten zetten: gemeente, bedrijven en burgers
- Bij mijn bedrijfsbezoeken kom ik nog veel onwetendheid tegen, soms is er met een paar eenvoudige aanpassingen al veel energiewinst te halen; dat betekent dat ondernemers goed geïnformeerd moeten worden
- Als gemeente hebben we verschillende subsidieregelingen voor bedrijven, vaak is dat net het laatste zetje om duurzame energie te gaan gebruiken

Tegen
- Vaak worden we als gemeente verantwoordelijk gesteld, maar er zijn er wel meer die verantwoordelijk zijn
- Alle investeringen kosten geld, als gemeente hebben we dat ook niet altijd

Customer (product buyer)

Voor
- Het is belangrijk om goed voor de aarde te zorgen, ik wil graag dat m'n kleinkinderen hier ook nog ongestoord kunnen leven
- Ik heb er best wat extra voor over om duurzame energie te gebruiken: het geeft een goed gevoel zelf iets voor een betere wereld te kunnen doen

Tegen
- Uiteindelijk moet toch iemand al die investeringen betalen en meestal komt die rekening dan bij de consument terecht; dus alles wordt alleen maar duurder
- Op m'n eigen energiegebruik letten? Dat is maar een druppel op een gloeiende plaat; laat ze eerst de grote jongens maar eens aanpakken!

Voor/tegen
- Ik weet wel dat gebruikmaken van duurzame energie beter is, maar het is vaak ook duurder; dit is de afweging die je maakt

3.5 Interviewing techniques

The interview techniques contain some tips for conducting a successful interview, for both the preparation of the interview itself. Important: be aware of the time limit for the interview, or appoint an assistant as time keeper.

The questions

Think about the structure and type of questions you ask. The order in which you ask the questions can influence the answers you get. When a wrong question is asked at the wrong time, the informant may become frustrated or even close. Therefore, the beginning of the interview should be easy, and should become more in depth and difficult over time. For example, start with knowledge questions, then ask for opinions and end with questions about behaviour. Other options for structure include:

Chronological structure	Past → Present → Future
Problem structure	Problem → Cause → Effects → Solutions
Investigative structure	Problem → Method → Results → Conclusion

The different types of questions that can be asked during an interview are explained in more detail below.

Open questions
- What do you think of your results?
- Can you tell us something about your research?

With an open question you give your discussion partner space to tell what he/she thinks is important. He/She can formulate his/her own answer and determine the direction and content of the conversation. If you use open questions, you have a chance that the other person answers your question in a (too) broad way on. When this happens, you might need to guide the interviewee into the desired direction

Closed questions
- Do you think that an evaluation of the management plan is yet to be carried out this year?
- Did you like that book?

With a closed question you can obtain specific information from your discussion partner, and allows you to check whether you have understood the other person correctly.

A closed question provides an answer as 'yes' or 'no', or another simple answer, such as 'nice' or 'good'. That may be pleasant, but your discussion partner may feel that he/she is limited in his/her answers, and therefore become frustrated. Your discussion partner gets pushed into a passive role, when you only ask closed questions, which leads them to feel less responsible for the conversation. Closed questions can sometimes also be suggestive and biased.

Business questions
- What is your prior education?
- What is your position in the company?

With a business question, you ask for facts. That can be very useful when you want to inform your audience. An interview is very boring when only business questions are asked.

Personal questions
- How do you combine your work with your private life?
- Is this your dream job?

With a personal question, you ask for an opinion or experience. This can be very informative. Your audience could have similar questions, then it is nice to hear the opinion or experience from someone else. In addition, people tend to like it to listen/watch a personal story.

Exciting questions

Exciting questions make an interview fun to watch. If you do it right, you get to laugh with the interviewee. In any case, it is not the intention that you insult someone with it. If there are any prejudices about your interviewee about his / her profession, then you can refute it with exciting questions.

Extra tips

Do not ask more than one question at a time, avoid multiple questions. So not: "What do you think of the application of modified corn starch in food, what advantages and disadvantages do you see and what effects will this application have on the human body in the longer term?". Do ask questions like: What do you think about the use of modified starch in food?" And "What advantages does the use of modified starch in foodstuffs have?".

Formulate the questions as concretely as possible. Not: "What do you think of the education policy of the new cabinet?". But: 'What do you think of the plans of the new cabinet to test children at the age of four?'

The interview

In the introduction you lay the foundation for the conversation. So be on time for the meeting and introduce yourself properly. Install yourself quickly and silently: make sure you know how the recording equipment works and how much time there is for the conversation/interview and filming. Make sure you have a nice setup and do not sit right across each other. Create a good atmosphere, have some small talk. It is also important to make some agreements with the interviewee about how you use the interview. For example, you could make an agreement with the interviewee that you show the final version of interview to him/her, give him/her some time to point out points of improvement, and then post it online.

The goal is to get the interviewee to answer your questions completely. Give yourself time to think about an answer given. Is the answer usable? Is it complete? Is it relevant? Is it clear? The interview assistant has an important role in this. Sometimes you have a chatty person in front of you who talks without really getting to a point; you must guide him/her. You can repeat the question and clarify, repeat (part of) the answer and summarize it in your own words, or use signal words like 'ok' and 'thank you'. It's also possible that someone's answers are too short; you can try to encourage him/her to tell you more. You can ask questions ('What do you mean?', 'Can you tell me a little more about that?' And 'It is not clear to me yet'), or ask specific questions ('How did that happen?', 'Why do you think that?' and 'What happened after that? '). A moment of silence can also be an option: often a reflection period is enough for the informant to continue talking. It is also important to show that you are listening, by 'humming', repeating last words (like a parrot) and by looking and nodding.

This text is copied and translated from 'Tube Your Future', van www.tubeyourfuture.nl.

3.6 Mind mapping

Mind mapping is a brainstorm technique. A mind map is an intuitive arrangement of thoughts, ideas, opinions and facts. The central subject is written in the middle of the page or a drawing is made of the subject. Key words are written around the central subject, and short texts can be written next to them. It is also possible to write down words connected to the keywords. Keywords that are connected to each other will be connected using straight lines. Different colours can be used in this process, to apply structure to the mind map. From the central subject, thick lines are drawn to the first key words, which become thinner towards the edges of the sheet.

Use a clear structure for organizing the data. If the mind map becomes unclear or messy during the process, it is useful to reorder/redraw the mind map.

3.7 Infographics

Infographics are informative illustrations that show (complex) information quickly and clearly. The brain processes images faster than text. Think, for example, of maps, traffic signs, graphs. instructive drawings and interactive applications. Infographics are used all around us to transfer information, data and knowledge. Examples of infographics of this project, per episode, can be found in Appendix I.

3.8 Key questions ★

The 'Narrative designing' didactics, which are explained in more detail in section 4.2, work with key questions and therefore key questions also play an important role in the Schools for Sustainability projects. Key questions ensure that students actively and productively get started. Key questions also provide space and structure when executing the design. Space, for own insights and ideas, and structure are important because it gives the students the confidence that their answers and ideas cannot be wrong.

Good key questions have the following properties:

- Multiple answers are possible
- Encourage students to use analytical thinking
- Activate students to look up more information
- Stimulate the imagination and fantasy of the students
- Offer students the opportunity to gain and present their own experiences
- Give students the opportunity to gain knowledge and use their existing knowledge
- Provide students with a secure feeling; several good answers are possible
- Give the students a sense of responsibility
- Lead towards new questions among the students, which they then want to answer themselves
- Give teachers the opportunity to guide the students in the desired direction
- Often start with: "How could …..."
- Ask for opinions rather than facts

Before asking a key question, think about the type of answer you want from the students. The more open the question, the more space you give the students in their answer. It is important to adjust the key question to the level of the students.

4. Background information

4.1 IVN Junior Consultancies – A bridge between youth and society

'Junior Consultancies' is IVN's national program for secondary schools and stands for education with high quality and coherence between courses. Since 2001, the IVN program offers various projects each year with a current, social and sustainable context. The 'authenticity' of a project always comes first. Within the 'IVN Junior Consultanciy' program authenticity means that there is a real research question where students will be working on. A real assignment, coming from a real client, with the support of real experts, ensures that the students explore the community outside the familiar school environment. In addition to the students themselves, clients, subject-specific experts and other opinion makers also play a key role in these projects. The projects have varying content, and in many cases the young and uninhibited students provide interesting and surprising results.

For example, hundreds of students advised their deputy about the economic future of their province, others discovered the value of the cultural heritage in their region. Whilst some students discussed the complex relationship between nature conservation, recreation and agriculture and other students developed energy-saving techniques for their own school building. More information about the program and the projects per province can be found on www.ivn.nl/jongeren (in Dutch).

Sustainability in secondary schools: what does that mean in practice

Students work based on active work forms and projects with questions from civil society organizations. They meet with representatives of the companies and civil society organizations, whom have given the assignment to the students. They conduct research or make a design around a current social issue. This yields cross-curricular and problem-oriented education with topics that are at the centre of current affairs. The activating didactics of 'Storyline Approach' are used in the IVN Junior Consultancy program.

Junior Consultancy: A program of IVN

IVN contributes to a sustainable society by involving people in nature, the environment, landscape and the living environment. IVN accomplices this through cooperation, education and communication, as initiator and as partner. IVN consists of an association of volunteers and a foundation build on professionals. The voluntary organization consists of approximately 170 local IVN departments with more than 25,000 members, which are active for their department. They organize fun and educational activities for people of all ages. Think of walking and cycling excursions, courses, workshops and children's activities. The volunteers are also occasionally involved in municipal consultations on nature subjects and use their knowledge to assist in school projects.

The IVN professionals work from provincial IVN branches. Often the professionals work together with partners whom also are active in the field of nature and environmental education and communication. Examples of clients of IVN, are educational institutions organizations for nature and environmental education, companies, social organizations and governments at local, provincial and national level. The work of IVN leads to a wide range of activities, services and products. One of those products is this program for secondary education: IVN Junior Consultancy.

4.2 Didactics: Storyline Approach

Within the projects of IVN Junior Consultancy, the didactics of 'Storyline Approach' are applied. The so called Storyline Approach finds its origin in Scotland, about 35 years ago. This is where Steve Bell and his colleagues developed the original: the 'Storyline Approach to Education'. Erik Vos introduced the didactics in Dutch primary education and PABOs. In secondary education and for teacher trainings, these didactics have been used since 1996 (see section 3.6 for publications).

In this didactics, a storyline is always used as the baseline. This story forms the context within which the students carry out their learning activities. Characteristic of the storyline approach is the high extent of involvement that the didactics evoke with the students. The activating work form challenges them to think of their own approach and solution. Answers can´t be found in answer books, but only by doing research in their own environment. Because of the authentic sources and contacts with real experts, young people have an inquiring attitude towards the subject. Pupils become motivated, enterprising and are proud of their own work.

Within the IVN Junior Consultancy program, the storyline approach provides education with a high level of 'authenticity'. After all, every project involves a real assignment, set out by a real client. The assignments are current and have always been placed within a social context. Support from real experts ensures that students start to explore society outside the familiar school environment. They encounter different people, recognize the face that different people have different interests on the subject, and form their own conclusions.

Because the students will often need to reach out to society, they learn to apply all kinds of (social) skills and develop them further. In addition to developing social skills, the storyline approach also makes a strong appeal to the imagination and inventiveness of the students, and improve their skills in cooperation.

The didactics 'Storyline Approach' offers opportunities for cross-curricular education. In addition, projects from IVN Junior Consultancy are suitable for all levels of education. The role of the teacher changes when using the didactics of narrative design. The teacher no longer simply states the facts, but tries to tap into what students already know. The teacher does not give the answers, but helps the students to ask the right questions; the key questions. Questions that help them learn and that teach them to learn on their own and together with others. Within storyline approach, the teacher basically creates the framework within which research is carried out by the students. It is important that the teacher guides the students when it seems the students wander off into an undesired direction. The teacher can do this by asking 'smart' questions or key questions, to let students indirectly make a good decision for the direction regarding their research. More information about asking key questions can be found in section 3.8.

4.3 Support within the school

By reading this script, you will get an idea of the content of the assignment and the framework wherein the assignment will be carried out. During the required teacher training, the teachers experience the 'Storyline Approach' didactics by practicing it. Experiencing it yourself says more than a thousand words. The principle of the storyline approach is also explained in the scenario. At the end of the training the teachers can explain the story line at school and to guide the students during the process. Before the training day is finished, agreements are made with those present regarding possible planning.

It is very important that good agreements are made at school, in consultation with colleagues, on the planning of the execution of the project. By informing colleagues and other important 'pawns' at school about the project, you create support. These 'pawns' can differ each time; for example, think of the schoolteam leader, project coordinator, school director or the education committee. These people probably appreciate it when they are informed about the project and will be particularly interested in the relationship with the education development policy.

A 'Buddy'

Should questions or problems arise during the project, then the teacher should know that he / she can always turn to the project management from IVN Junior Consultancy (Geo Circle). For quick solutions for internal obstacles, appropriate to the education policy the teacher or teaching assistant are familiar with, it is nice to have someone at school where you can go to. By informing colleagues and / or other important 'pawns' within the school about the project, you create a 'buddy' for yourself where you can go to if you need a listening ear.

Involve colleagues and parents/guardians

Colleagues, but also parents/guardians of students can be informed about the project by sending them a letter in advance. A team meeting or a parents' evening are also excellent moments to inform colleagues and parents/guardians about the coming project. Parents often find it interesting to know what their son or daughter is doing at school. By involving them, the assignment and the final presentation for the students become even more realistic.

Capture the process in image and text

Another way to involve people in your students' project, is to capture the process in image and text. With a digital camera at hand, you can capture moments when students show other talents than usual. These photos can be used on the school's own website, but are also welcome at the Geo Circle website. The pictures can be shown to parents and colleagues or can serve as support during the official presentation. Pupils could occasionally write about the project or the process that goes along with it. This way, the communication skills of the students are stimulated in a completely different way. In addition to these forms of internal publicity, the photographs and written pieces can also be used in the search for external publicity, for example when the school itself tries to get press attention to report on the work of the pupils.

4.4 Organization within the school

The execution of a project with a real assignment, a real client and an official presentation moment at the end of the project, can generate a lot of enthusiasm and energy for both the teacher and the pupils. The foundation is laid and now it is up to the teacher to decide to what extent the students will dive into the assignment.

Organizational structures

To give a helping hand regarding the possible organization within the school, there are some suggestions of organization models tested in practice added below.

Parallel model

An episode will be started, guided and closed by one person; a person who does not pay special attention to one discipline, like as a mentor. Other teachers participating in the project will carry out learning activities that fit within the lessons of their own subject. The course lessons run parallel and follow the normal schedule. In the meantime, it is possible for the coordinating teacher to organize one or two moments with the pupils to see whether ideas from the different groups may contradict each other. The pupils can discuss this with each other. A disadvantage of this model is that the relationship between the individual learning activities can be defective. An advantage is that little mutual coordination is needed to be able to run the project together.

Intensive collaboration model

The timetable is solely intended to provide an overview of contact moments between pupils and teachers. The participating teachers all follow the course of the scenario. It is therefore possible that teachers take care of parts of each other's courses. This model only works well within small partnerships. A disadvantage is that this model requires extra coordination, both organisationally and professionally, and a good progress transfer. An advantage is that this model works very well for the students, because it makes it easier to see the bigger picture.

Project model

The project is planned to be completed during several (theme) days. The students will have access to supervising teachers, which they can ask help from during these intensive and hectic days. This project model gives students, because of the short time of execution, only few opportunities to take initiatives themselves and to gather information and opinions from different angles. When the school immediately decides to choose this organizational model and still is interested in contacting experts to be implemented in the project, it is wise to contact the project management from IVN as soon as possible. Agreements with experts can be scheduled early this way. A disadvantage is that the school can see the project as a short-term incident and students have little time to develop their own ideas and initiatives. An advantage is that the storyline becomes particularly clear for the students.

Combination model

The design is partly carried out within the normal schedule and partly within freely scheduled project hours.

Organizational matters

Apart from the fact that a workable model has to be found for the current organization at the school for the execution of the project, it is recommended for teachers to take the following into account:

- If possible, spread the project work over a period as long as possible; This gives students the opportunity to grow in the project which in turn allows their involvement with the subject and the project to grow
- provide variety in both group work and individual work and try to ensure that pupils do not always work in the same groups
- when using the 'Storyline Approach' didactics, you as a teacher will have the role of a coach who tries to support and direct his / her students; students need space to develop skills and their ideas, the task of the teacher is to give structure so that this is possible
- Encourage your students to deliver good-quality work; good quality work gives them satisfaction, pride and will cause them to be more involved with the subject
- Ensure quality and depth in the project work by setting substantive requirements for the project and being positively critical
- Let your students practice their presenting skills by letting the students present their progress to each other; this makes them accustomed to presenting, to positive critical feedback and by means of questions new ideas may be fuelled
- Make sure there is a basis in the form of background information available for your students, so they do all the research they want, and won't be inhibited in their enthusiasm

Presenting

At every Junior Consultancy project, IVN or a nature and environmental education organization ensures that the project is concluded with a central closure (meeting). IVN consciously chooses to have this central closure preferably outside the familiar school walls. This makes the presentation even more official and will encourage many students to get the best out of themselves. IVN will ensure that experts, public figures and / or clients attend the presentation; the school's task is to mobilizing teachers, students and other interested parties. The fact that IVN organizes a central closure outside the school does not mean that no presentation can be organized within the school. This is an excellent moment to hold a 'final rehearsal'. Keep the presentation substantive and sober. This way it can really serve as a real exercise for 'the real job'. However, you can pay extra attention to a professional invitation, decoration of the room, clothing of the students and writing a press release by the students.

Publicity

By IVN external publicity is often sought for the projects, but the school can also play a publicity role. Photos, small articles, vlogs and other material can be given a place on the school website. But the school could also seek publicity outside the school. A substantive presentation of students about a current social theme often also works well in the press. Especially local and regional press want to pick up such news and post an article and / or photo about it. The chance of this will be much greater if a proper press release is sent from school. Sometimes, it is possible to work together with the client to gain publicity.

4.5 Sustainability

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland definition). Sustainably development has to do with many different aspects, including the environment, equitable distribution of resources, sustainable energy, nature and so on.

Sustainability contains the following aspects:

People	Social aspects, distribution, justice
Planet	Ecological aspects
Profit	Economical aspects
Time	Now and in the future
Space	All over the globe

Sustainable development is the concept where ecological, economic and social needs meet each other, for this generation and the ones in the future. With sustainable development the goal is to set an equilibrium for People, Planet and Profit. The definition sustainable development covers all technical, social, ecological and economic development which aims for a more efficient, saving manner of living.

When talking about strictly weak sustainability, any conversion of natural capital into economic or social benefits is acceptable. On the other side of the spectrum with a strictly strong sustainability, any irreparable damage of natural capital is unacceptable.

Climate neutral

Climate change is a global environmental problem. It is closely connected with the Western energy-intensive economy. Around two third of the enhanced greenhouse effect is caused by CO_2 emissions associated with the use of fossil fuels such as coal, petroleum and natural gas. In addition to CO_2, there are other gases that cause the greenhouse effect, which are often converted to their CO_2 equivalent. Greenhouse gas emissions are still rising in volume, and economy is growing, especially in developing countries, which means the problem is getting bigger and bigger.

Climate neutral or CO_2 neutral are terms that indicate that a process does not contribute to climate change. Climate compensation and CO_2 compensation are terms that indicate that for an organization, a (production) process or a product, the emission of greenhouse gases, such as CO_2, are compensated. The terms are used interchangeably.

Climate-neutral energy

Climate-neutral energy means renewable energy. When climate-neutral energy is generated, that does not mean that no CO_2 is emitted. CO_2, for example, comes from the chimney of a biomass power station. However, this is still part of the carbon cycle; the composition of the atmosphere does not change. This contrasts with processes in which fossil fuels are used: the CO_2 (or only the carbon, through combustion, the carbon is converted into CO_2) that is released when burning fossil fuels was captured millions of years ago in petroleum, gas, coal and peat. By burning these fuels, the carbon is returned to the atmosphere, which changes the balance.

Climate compensation

Climate compensation is compensating for the emission of greenhouse gases associated with an organization, production or consumption. For the environment it does not matter where the CO_2 is emitted, or where the

CO2 is removed from the atmosphere. Sometimes it is not (yet) possible to reduce the CO2 emissions of a certain company itself, because this is too expensive, for example. In principle, all products and companies lend themselves to being climate neutral or CO2-free. Climate compensation quickly delivers emission reductions that require a much longer term in existing technical systems.

Not all forms of climate compensation are equivalent. In 1996, the term 'Trias Energetica' was conceived in the Netherlands by Novem, a three-step plan intended for companies, households and governments, to become climate-neutral step by step. They are three consecutive steps:

Step 1   Prevent as many emissions as possible. This can be done by a change in behaviour, for example: Trying to carpool to work, do not use airplanes or eating less meat. Emissions can also be reduced by saving energy. This can be done by isolating your house, using LED's, using rainwater to flush your toilet or by buying energy saving machines.

Step 2   It is also advised that sustainable and renewable energy is used as a source. Think of energy from biomass, water, sun or the wind. It is also possible to generate your own power, by buying solar panels or a small windmill.

Step 3   When all other things have been done, the only thing left to do is compensation for the energy you did use. This can be done for example by planting trees. Compensation is a temporarily measure which can be used until a better solution is available.

4.6 Publications and websites

In the IVN Junior Consultancy projects the didactics of the 'Storyline Approach' are used. You can find more information about these didactics on the Dutch website www.verhalendontwerpen.nl and in the following publications (in Dutch):

- **Book: Scenario's voor actief leren; verhalend ontwerpen in het voortgezet onderwijs**
  Erik Vos, Ellen Reehorst e.a.; Koopman & Kraaijenbrink Publishing 2005, 2e druk
  (1e druk 1999 Wolters-Noordhoff)
  Emphasizes on the didactics of active learning with examples from secondary education.
- **Book: Verhalend Ontwerpen, een draaiboek**
  Erik Vos, Peter Dekkers; Wolters-Noordhoff, vijfde gewijzigde druk, 2004
  Emphasizes on the technics of the storyline approach with examples from primary education.
- **Website: Wikipedia (En) 'Storyline method'**
  https://en.wikipedia.org/wiki/Storyline_method
- **Website: Storyline Scotland (En)**
  http://www.storyline-scotland.com/

Appendix I Infographics energy project (as example)

Episode 1: **Start**

1. Start   2.   3.

De opdrachtgever zit met een probleem

De groep start een energieadviesbureau ...

verdiept zich in het probleem ...

De taken worden verdeeld en het adviesbureau gaat van start

en komt samen tot een goed idee!

Wie
Wat Waar
Wanneer
Waarom
Hoe
Vragen Antwoorden

Episode 2: Uitwerking

1. | 2. Uitwerking | 3.

Het is tijd om op onderzoek uit te gaan!

Verdieping
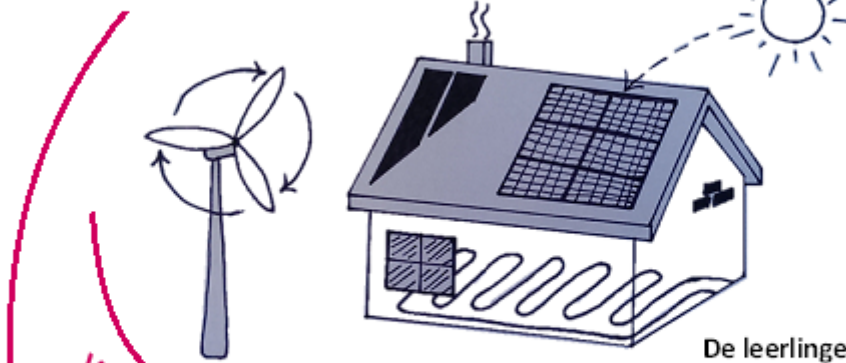
De leerlingen doen onderzoek naar energieverbruik en werken met de Quintel Huismodule

Informatie verzamelen, interviews afnemen, op excursie …

… alles om tot antwoorden te komen, de onderzoeksvragen te specificeren en gesprekken te kunnen voeren met experts

Er worden afbeeldingen gezocht bij de kernwoorden

De ideeën worden in kernwoorden verwerkt in een mindmap
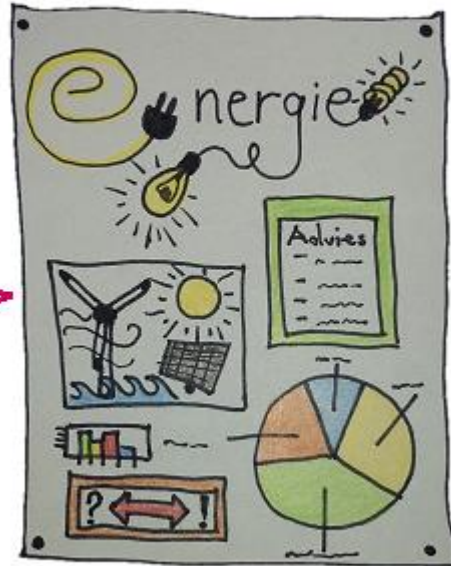
ENERGIE

Door het moodboard krijgt iedereen hetzelfde denkbeeld

De plannen voor de oplossing kunnen worden uitgewerkt in verschillende ontwerpen

Voorbeelden hiervan zijn ...

... een rapport

... een poster

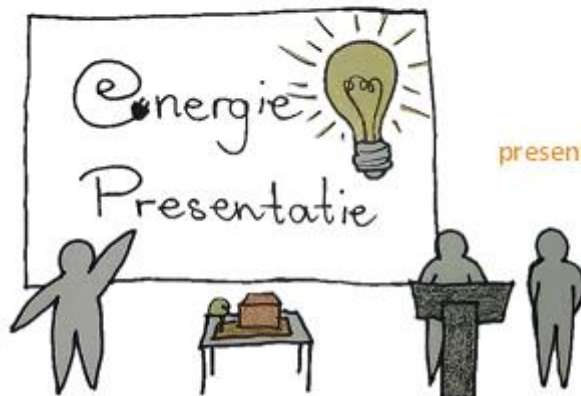Energie

Advies

... een maquette

Adviesrapport

... en..

Energie Presentatie
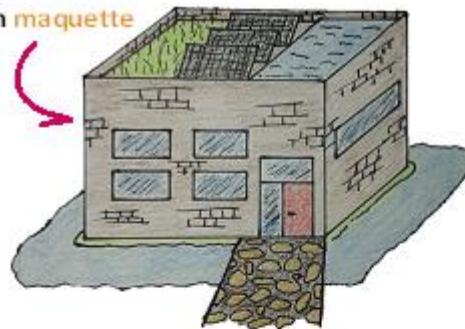
Tijd om de ideeën te presenteren en het rapport te overhandigen aan de opdrachtgever!

Succes!

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